



## NEC3 Engineering & Construction Contract

Between **ESKOM HOLDINGS SOC Ltd**  
(Reg No. 2002/015527/30)

and **[Insert at award stage]**  
(Reg No. \_\_\_\_\_ )

for **Design, manufacturing, supply, installation, quality assurance, commissioning and handover associated to LOADING OF SRO CIP CHEMICALS AT LETHABO POWER STATION.**

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**CONTRACT No. 4600**

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## Part C1: Agreements & Contract Data

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# C1.1 Form of Offer & Acceptance

## Offer

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of:

**Provision of Design, manufacturing, supply, installation, quality assurance, commissioning and handover associated to LOADING OF SRO CIP CHEMICALS AT LETHABO POWER STATION.**

The tenderer, identified in the Offer signature block, has examined the documents listed in the Tender Data and addenda thereto and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance the tenderer offers to perform all of the obligations and liabilities of the *Contractor* under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the *conditions of contract* identified in the Contract Data.

Options A	The offered total of the Prices exclusive of VAT is	R [●]
	Sub total	R [●]
	Value Added Tax @ 15% is	R [●]
	The offered total of the amount due inclusive of VAT is <sup>1</sup>	R [●]
	(in words) [●]	

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document including the Schedule of Deviations (if any) to the tenderer before the end of the period of validity stated in the Tender Data, or other period as agreed, whereupon the tenderer becomes the party named as the *Contractor* in the *conditions of contract* identified in the Contract Data.

Signature(s)

Name(s)

Capacity

**For the tenderer:**

(Insert name and address of organisation)

Name & signature of witness

Date

Tenderer's CIDB registration number (if applicable)

<sup>1</sup> This total is required by the *Employer* for budgeting purposes only. Actual amounts due will be assessed in terms of the *conditions of contract*.

**Acceptance**

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the tenderer's Offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the *conditions of contract* identified in the Contract Data. Acceptance of the tenderer's Offer shall form an agreement between the Employer and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract, are contained in:

- Part C1        Agreements and Contract Data, (which includes this Form of Offer and Acceptance)
- Part C2        Pricing Data
- Part C3        Scope of Work: Works Information
- Part C4        Site Information

and drawings and documents (or parts thereof), which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Returnable Schedules as well as any changes to the terms of the Offer agreed by the tenderer and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Form of Offer and Acceptance. No amendments to or deviations from said documents are valid unless contained in this Schedule.

The tenderer shall within two weeks of receiving a completed copy of this agreement, including the Schedule of Deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the *conditions of contract* identified in the Contract Data at, or just after, the date this agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy signed between them of this document, including the Schedule of Deviations (if any).

Unless the tenderer (now *Contractor*) within five working days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the Parties.

Signature(s)

Name(s)

Capacity

**for the  
Employer**

.....  
*(Insert name and address of organisation)*

Name &  
signature of  
witness

Date

Note: If a tenderer wishes to submit alternative tenders, use another copy of this Form of Offer and Acceptance.

**Schedule of Deviations to be completed by the Employer prior to contract award**

Note:

1. This part of the Offer & Acceptance would not be required if the contract has been developed by negotiation between the Parties and is not the result of a process of competitive tendering.
2. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.
3. A tenderer's covering letter must not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid be the subject of agreement reached during the process of Offer and Acceptance, the outcome of such agreement shall be recorded here and the final draft of the contract documents shall be revised to incorporate the effect of it.

No.	Subject	Details
1		
2		
3		
4		
5		
6		
7		
8		

By the duly authorised representatives signing this Schedule of Deviations below, the Employer and the tenderer agree to and accept this Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules, as well as any confirmation, clarification or changes to the terms of the Offer agreed by the tenderer and the Employer during this process of Offer and Acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the tenderer of a completed signed copy of this Form shall have any meaning or effect in the contract between the parties arising from this Agreement.

*For the tenderer:*

*For the Employer*

Signature \_\_\_\_\_

\_\_\_\_\_

Name \_\_\_\_\_

\_\_\_\_\_

Capacity \_\_\_\_\_

\_\_\_\_\_

On behalf of *(Insert name and address of organisation)*

*Lethabo Power station  
 Deneysville Vaal dam Road  
 Vereeniging  
 1930*

Name & signature of witness \_\_\_\_\_

\_\_\_\_\_

Date \_\_\_\_\_

\_\_\_\_\_

# C1.2 ECC3 Contract Data

**Part one - Data provided by the *Employer***

Completion of the data in full, according to the Options chosen, is essential to create a complete contract.

Clause	Statement	Data
<b>1</b>	<b>General</b>	
	<p>The <i>conditions of contract</i> are the core clauses and the clauses for main Option</p> <div style="background-color: #cccccc; width: 100px; height: 20px; margin-bottom: 5px;"></div> <p>dispute resolution Option</p> <p>and secondary Options</p> <div style="background-color: #cccccc; width: 100px; height: 20px; margin-bottom: 5px;"></div> <div style="background-color: #cccccc; width: 100%; height: 150px; margin-bottom: 5px;"></div> <p>of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)</p>	<p><b>A: Priced contract with activity schedule</b></p> <p><b>W1: Dispute resolution procedure</b></p> <p><b>X1: Price adjustment for inflation</b></p> <p><b>X2: Changes in the law</b></p> <p><b>X4: Parent company guarantee</b></p> <p><b>X5: Sectional Completion</b></p> <p><b>X7: Delay damages</b></p> <p><b>X13: Performance Bond</b></p> <p><b>X14: Advance payment to the <i>Contractor</i></b></p> <p><b>X16: Retention</b></p> <p><b>X18: Limitation of liability</b></p> <p><b>Z: <i>Additional conditions of contract</i></b></p>
10.1	The <i>Employer</i> is (Name):	<b>Eskom Holdings SOC Ltd (reg no: 2002/015527/30), a state owned company incorporated in terms of the company laws of the Republic of South Africa</b>
	Address	<b>Registered office at Megawatt Park, Maxwell Drive, Sandton, Johannesburg</b>
10.1	The <i>Project Manager</i> is: (Name)	
	Address	<b>Lethabo Power Station Deneysville Rd Viljoensdrift</b>

	Tel	
	Fax	N/A
	e-mail	
10.1	The <i>Supervisor</i> is: (Name)	
	Address	<b>Lethabo Power Station Deneysville Rd Viljoensdrift</b>
	Tel No.	
	Fax No.	N/A
	e-mail	
11.2(13)	The <i>works</i> are	<b>Design, supply and install including the eductor system on the Spiral Reverse Osmosis Chemical Cleaning in Place (CIP) system. The inclusion of this eductor system will reduce the impact on human life by minimising manual labour and increasing safe usage and offloading of chemicals for the system chemical cleans. The high-level scope of this project is applicable to the Spiral Reverse Osmosis (SRO) CIP system at Lethabo Power Station.</b>
11.2(14)	The following matters will be included in the Risk Register	<b>See Risk Management in part 3</b>
11.2(15)	The <i>boundaries of the site</i> are	<b>Areas associated with the scope of work to be performed</b>
11.2(16)	The Site Information is in	<b>Part 4: Site Information</b>
11.2(19)	The Works Information is in	<b>Part 3: Scope of Work and all documents and drawings to which it makes reference.</b>
12.2	The <i>law of the contract</i> is the law of	<b>the Republic of South Africa</b>
13.1	The <i>language of this contract</i> is	<b>English</b>
13.3	The <i>period for reply</i> is	24 hours during outages and emergencies, 3 working days for other requests during the normal operations in execution of the contract
<b>2</b>	<b>The Contractor's main responsibilities</b>	<b>Data required by this section of the core clauses is provided by the Contractor in Part 2 and terms in italics used in this section are identified elsewhere in this Contract Data.</b>
<b>3</b>	<b>Time</b>	
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	<b>Six months from the official start Date</b>
11.2(9)	The <i>key dates</i> and the <i>conditions</i> to be met are:	<b>Condition to be met</b> <span style="float: right;"><b>key date</b></span>

		1	Detailed Design submission and approval	As per accepted program
		2	Procurement of material, Fabrication (Including FAT) & Delivery to site	As per accepted program
		3	Construction of the Whole Works	As per accepted program
		4	Commissioning and Testing	As per accepted program
		5	Training and configuration management	As per accepted program

30.1	The <i>access dates</i> are:	<b>Part of the Site</b>		<b>Date</b>
		1	Safety File approval	As per accepted program
		2	Safety Induction	As per accepted program
		3	Access to Plant area for works	As per accepted program

31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	<b>Two (2) weeks of the Contract Date.</b>
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31.2	The <i>starting date</i> is	<b>TBA</b>
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32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	<b>One week</b>
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35.1	The <i>Employer</i> is not willing to take over the <i>works</i> before the Completion Date.	The Employer will take over the Works at the Completion of the whole works
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**4 Testing and Defects**

42.2	The <i>defects date</i> is	<b>52 weeks after Completion of the whole of the works.</b>
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43.2	The <i>defect correction period</i> is	<b>Defects affecting system availability must be resolved within 4 (four) hours. Latent defects and defects not impacting system availability must be resolved within 2 (two) weeks after notification</b>
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	except that the <i>defect correction period</i> for	<b>is two weeks</b>
	and the <i>defect correction period</i> for	<b>is two weeks</b>

**5 Payment**

50.1	The <i>assessment interval</i> is	<b>The assessment interval will be between the 25th day of each successive month and based on the completed activities as per NEC option A guidelines.</b>
51.1	The <i>currency of this contract</i> is the	<b>South African Rand.</b>
51.2	The period within which payments are made is	<p>Thirty (30) Calendar days after the signed assessment by both Parties and a valid Tax Invoice.</p> <p>ATTENTION: Eskom's standard policy on payment term for all contracts valued above R50 000 0000 (Fifty Million Rand), including VAT, is 60 days. Bidders are requested to bear this payment term in mind when submitting bids and concluding contracts.</p>
51.4	The <i>interest rate</i> is	<b>the publicly quoted prime rate of interest (calculated on a 365 day year) charged from time to time by the Standard Bank of South Africa Limited (as certified, in the event of any dispute, by any manager of such bank, whose appointment it shall not be necessary to prove) for amounts due in Rands.</b>

**6 Compensation events**

**All Compensation Events are to be managed as per core clause 6 of the NEC3 ECC**

60.1(13)	The place where weather is to be recorded is:	<b>Lethabo Power Station</b>
	<b>The <i>weather measurements</i> to be recorded for each calendar month are,</b>	<p><b>the cumulative rainfall (mm)</b></p> <p><b>the number of days with rainfall more than 10 mm</b></p> <p><b>the number of days with minimum air temperature less than 0 degrees Celsius</b></p> <p><b>the number of days with snow lying at 09:00 hours South African Time</b></p> <p><b>and these measurements:</b></p>
	The <i>weather measurements</i> are supplied by	<b>South African Weather Services</b>
	The weather data are the records of past weather measurements for each calendar month which were recorded at	<b>Lethabo Power Station</b>
	and which are available from:	

		<b>the South African Weather Bureau and included in Annexure A to this Contract Data provided by the <i>Employer</i></b>
60.1(13)	Assumed values for the ten year return <i>weather data</i> for each <i>weather measurement</i> for each calendar month are:	<b>As stated in Annexure A to this Contract Data provided by the <i>Employer</i>.</b>
<b>7</b>	<b>Title</b>	<b>To be managed as per core clause 7 of the NEC3 ECC</b>
<b>8</b>	<b>Risks and insurance</b>	
80.1	These are additional <i>Employer's</i> risks	<ol style="list-style-type: none"> <li>1. Natural disaster</li> <li>2. Industrial action</li> <li>3. . Community Unrest</li> </ol>
<b>9</b>	<b>Termination</b>	<b>To be managed as per core clause 9 of the NEC3 ECC</b>
<b>10</b>	<b>Data for main Option clause</b>	
<b>A</b>	<b>Priced contract with activity schedule</b>	<b>There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.</b>
<b>11</b>	<b>Data for Option W1</b>	
W1.1	The <i>Adjudicator</i> is	<b>the person selected from the ICE-SA Division (or its successor body) of the South African Institution of Civil Engineering Panel of Adjudicators by the Party intending to refer a dispute to him. (see <a href="http://www.ice-sa.org.za">www.ice-sa.org.za</a>). If the Parties do not agree on an Adjudicator If the Parties do not agree on an Adjudicator the Adjudicator will be appointed by the ICE-SA</b>
W1.2(3)	The <i>Adjudicator nominating body</i> is:	<b>the Chairman of ICE-SA a joint Division of the South African Institution of Civil Engineering and the London Institution of Civil Engineers. (See <a href="http://www.ice-sa.org.za">www.ice-sa.org.za</a> ) or its successor body.</b>
W1.4(2)	The <i>tribunal</i> is:	<b>arbitration.</b>
W1.4(5)	The <i>arbitration procedure</i> is	<b>the latest edition of Rules for the Conduct of Arbitrations published by The Association of Arbitrators (Southern Africa) or its successor body.</b>
	The place where arbitration is to be held is	<b>Johannesburg, South Africa</b>
	The person or organisation who will choose an arbitrator	
	- if the Parties cannot agree a choice or	

- if the arbitration procedure does not state who selects an arbitrator, is

**the Chairman for the time being or his nominee of the Association of Arbitrators (Southern Africa) or its successor body.**

## 12 Data for secondary Option clauses

<b>X1</b>	<b>Price adjustment for inflation</b>			
X1.1(a)	The <i>base date</i> for indices is	<b>One month prior to Tender closing date</b>		
X1.1(c)	The proportions used to calculate the Price Adjustment Factor are:	<b>proportion</b>	<b>linked to index for</b>	<b>Index prepared by</b>
		0. [•]	<b>Material</b>	[•]
		0. [•]	<b>Labour</b>	[•]
		0. [•]	<b>Transport</b>	[•]
		15%	<b>non-adjustable</b>	<b>Fixed</b>
	Total	<b>100%</b>		
<b>X2</b>	<b>Changes in the law</b>		<b>Becomes a Compensation Event only if the changes in the Law of the Republic of South Africa took place after the Contract Date.</b>	
<b>X4</b>	<b>Parent company guarantee</b>		<b>There is no reference to Contract Data in this Option and terms in italics are identified elsewhere in this Contract Data.</b>	
<b>X5</b>	<b>Sectional Completion</b>			
X5.1	The <i>completion date</i> for each <i>section</i> of the <i>works</i> is:	<b>Section</b>	<b>Description</b>	<b>Completion date</b>
		1	Completion of Design and approvals	<b>As per accepted program</b>
		2	Completion of Material Purchase and Delivery (Fabrication workshop)	<b>As per accepted program</b>
		3	Completion Manufacturing and FAT	<b>As per accepted program</b>
			Delivery to site	

		<b>4</b>	Completion of construction	<b>As per accepted program</b>
		<b>5</b>	Completion of commissioning and SAT,	<b>As per accepted program</b>
		<b>6</b>	Training and Drawings Submission	<b>As per accepted program</b>
<b>X5 &amp; X7</b>	<b>Sectional Completion and delay damages used together</b>			
<b>X7.1 X5.1</b>	<b>Delay damages for late Completion of the sections of the works are:</b>	<b>2% per day of the Sectional Purchase Order Value</b>		
	The total delay damages payable by the Contractor does not exceed:	<b>15% of the Sectional Purchase Order Value</b>		
<b>X16</b>	<b>Retention</b>			
X16.1	The <i>retention free amount</i> is	<b>R0.00</b>		
	The <i>retention percentage</i> is	<b>10% of every payment certificate</b>		
<b>X18</b>	<b>Limitation of liability</b>			
X18.1	The Contractor's liability to the Employer for indirect or consequential loss is limited to:	<b>R0.0 (zero Rand)</b>		
X18.2	For any one event, the Contractor's liability to the Employer for loss of or damage to the Employer's property is limited to:	<b>the amount of the insurance deductibles relevant to the event</b>		
X18.3	The Contractor's liability for Defects due to his design which are not listed on the Defects Certificate is limited to	<b>The greater of the total of the Prices at the Contract Date and the amounts excluded and unrecoverable from the Employer's assets policy for correcting the Defect (other than the resulting physical damage which is not excluded) plus the applicable deductible as at contract date.</b>		
X18.4	The Contractor's total liability to the Employer for all matters arising under or in connection with this contract, other than excluded matters, is limited to:	<b>the total of the Prices other than for the additional excluded matters.</b>		
		<b>The Contractor's total liability for the additional excluded matters is not limited.</b>		
		<b>The additional excluded matters are amounts for which the Contractor is liable under this contract for</b>		

		<p>Defects due to his design which arise before the Defects Certificate is issued,          Defects due to manufacture and fabrication outside the Site,          loss of or damage to property (other than the works, Plant and Materials),          death of or injury to a person and infringement of an intellectual property right.</p>
X18.5	The <i>end of liability date</i> is	<p>(i) Seven (7) years after the <i>defects date</i> for latent Defects and</p> <p>(ii) the date on which the liability in question prescribes in accordance with the Prescription Act No. 68 of 1969 (as amended or in terms of any replacement legislation) for any other matter.</p> <p>A latent Defect is a Defect which would not have been discovered on reasonable inspection by the <i>Employer</i> or the <i>Supervisor</i> before the <i>defects date</i>, without requiring any inspection not ordinarily carried out by the <i>Employer</i> or the <i>Supervisor</i> during that period. If the <i>Employer</i> or the <i>Supervisor</i> do undertake any inspection over and above the reasonable inspection, this does not place a greater responsibility on the <i>Employer</i> or the <i>Supervisor</i> to have discovered the Defect.</p>
<b>Z</b>	<b>The <i>Additional conditions of contract</i> are</b>	<b>Z1 to Z17 always apply.</b>
<b>Z1</b>	<b>Cession delegation and assignment</b>	
Z1.1	The <i>Contractor</i> does not cede, delegate or assign any of its rights or obligations to any person without the written consent of the <i>Employer</i> .	
Z1.2	Notwithstanding the above, the <i>Employer</i> may on written notice to the <i>Contractor</i> cede and delegate its rights and obligations under this contract to any of its subsidiaries or any of its present divisions or operations which may be converted into separate legal entities as a result of the restructuring of the Electricity Supply Industry.	
<b>Z2</b>	<b>Joint ventures</b>	
Z2.1	If the <i>Contractor</i> constitutes a joint venture, consortium or other unincorporated grouping of two or more persons or organisations then these persons or organisations are deemed to be jointly and severally liable to the <i>Employer</i> for the performance of this contract.	
Z2.2	Unless already notified to the <i>Employer</i> , the persons or organisations notify the <i>Project Manager</i> within two weeks of the Contract Date of the key person who has the authority to bind the <i>Contractor</i> on their behalf.	
Z2.3	The <i>Contractor</i> does not alter the composition of the joint venture, consortium or other unincorporated grouping of two or more persons without the consent of the <i>Employer</i> having been given to the <i>Contractor</i> in writing.	

**Z3 Change of Broad Based Black Economic Empowerment (B-BBEE) status**

- Z3.1 Where a change in the *Contractor's* legal status, ownership or any other change to his business composition or business dealings results in a change to the *Contractor's* B-BBEE status, the *Contractor* notifies the *Employer* within seven days of the change.
- Z3.2 The *Contractor* is required to submit an updated verification certificate and necessary supporting documentation confirming the change in his B-BBEE status to the *Project Manager* within thirty days of the notification or as otherwise instructed by the *Project Manager*.
- Z3.3 Where, as a result, the *Contractor's* B-BBEE status has decreased since the Contract Date the *Employer* may either re-negotiate this contract or alternatively, terminate the *Contractor's* obligation to Provide the Works.
- Z3.4 Failure by the *Contractor* to notify the *Employer* of a change in its B-BBEE status may constitute a reason for termination. If the *Employer* terminates in terms of this clause, the procedures on termination are P1, P2 and P3 as stated in clause 92, and the amount due is A1 and A3 as stated in clause 93.

**Z4 Confidentiality**

- Z4.1 The *Contractor* does not disclose or make any information arising from or in connection with this contract available to Others. This undertaking does not, however, apply to information which at the time of disclosure or thereafter, without default on the part of the *Contractor*, enters the public domain or to information which was already in the possession of the *Contractor* at the time of disclosure (evidenced by written records in existence at that time). Should the *Contractor* disclose information to Others in terms of clause 25.1, the *Contractor* ensures that the provisions of this clause are complied with by the recipient.
- Z4.2 If the *Contractor* is uncertain about whether any such information is confidential, it is to be regarded as such until notified otherwise by the *Project Manager*.
- Z4.3 In the event that the *Contractor* is, at any time, required by law to disclose any such information which is required to be kept confidential, the *Contractor*, to the extent permitted by law prior to disclosure, notifies the *Employer* so that an appropriate protection order and/or any other action can be taken if possible, prior to any disclosure. In the event that such protective order is not, or cannot, be obtained, then the *Contractor* may disclose that portion of the information which it is required to be disclosed by law and uses reasonable efforts to obtain assurances that confidential treatment will be afforded to the information so disclosed.
- Z4.4 The taking of images (whether photographs, video footage or otherwise) of the *works* or any portion thereof, in the course of Providing the Works and after Completion, requires the prior written consent of the *Project Manager*. All rights in and to all such images vests exclusively in the *Employer*.
- Z4.5 The *Contractor* ensures that all his subcontractors abide by the undertakings in this clause.

**Z5 Waiver and estoppel: Add to core clause 12.3:**

- Z5.1 Any extension, concession, waiver or relaxation of any action stated in this contract by the Parties, the *Project Manager*, the *Supervisor*, or the *Adjudicator* does not constitute a waiver of rights, and does not give rise to an estoppel unless the Parties agree otherwise and confirm such agreement in writing.

**Z6 Health, safety and the environment: Add to core clause 27.4**

- Z6.1 The *Contractor* undertakes to take all reasonable precautions to maintain the health and safety of persons in and about the execution of the *works*. Without limitation the *Contractor*:

accepts that the *Employer* may appoint him as the "Principal Contractor" (as defined and provided for under the Construction Regulations 2014 (promulgated under the Occupational Health & Safety Act 85 of 1993) ("the Construction Regulations") for the Site; warrants that the total of the Prices as at the Contract Date includes a sufficient amount for proper compliance with the Construction Regulations, all applicable health & safety laws and regulations and the health and safety rules, guidelines and procedures provided for in this contract and generally for the proper maintenance of health & safety in and about the execution of *works*; and undertakes, in and about the execution of the *works*, to comply with the Construction Regulations and with all applicable health & safety laws and regulations and rules, guidelines and procedures otherwise provided for under this contract and ensures that his Subcontractors, employees and others under the *Contractor's* direction and control, likewise observe and comply with the foregoing.

Z6.2 The *Contractor*, in and about the execution of the *works*, complies with all applicable environmental laws and regulations and rules, guidelines and procedures otherwise provided for under this contract and ensures that his Subcontractors, employees and others under the *Contractor's* direction and control, likewise observe and comply with the foregoing.

**Z7 Provision of a Tax Invoice and interest. Add to core clause 51**

Z7.1 Within one week of receiving a payment certificate from the *Project Manager* in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice in accordance with the *Employer's* procedures stated in the Works Information, showing the amount due for payment equal to that stated in the payment certificate.

Z7.2 If the *Contractor* does not provide a tax invoice in the form and by the time required by this contract, the time by when the *Employer* is to make a payment is extended by a period equal in time to the delayed submission of the correct tax invoice. Interest due by the *Employer* in terms of core clause 51.2 is then calculated from the delayed date by when payment is to be made.

Z7.3 The *Contractor* (if registered in South Africa in terms of the companies Act) is required to comply with the requirements of the Value Added Tax Act, no 89 of 1991 (as amended) and to include the *Employer's* VAT number 4740101508 on each invoice he submits for payment.

**Z8 Notifying compensation events**

Z8.1 Delete from the last sentence in core clause 61.3, "unless the *Project Manager* should have notified the event to the *Contractor* but did not".

**Z9 *Employer's* limitation of liability**

Z9.1 The *Employer's* liability to the *Contractor* for the *Contractor's* indirect or consequential loss is limited to R0.00 (zero Rand)

Z9.2 The *Contractor's* entitlement under the indemnity in 83.1 is provided for in 60.1(14) and the *Employer's* liability under the indemnity is limited.

**Z10 Termination: Add to core clause 91.1, at the second main bullet point, fourth sub-bullet point, after the words "against it":**

Z10.1 or had a business rescue order granted against it.

**Z11 Addition to secondary Option X7 Delay damages (if applicable in this contract)**

Z11.1 If the amount due for the *Contractor's* payment of delay damages reaches the limits stated in this Contract Data for Option X7 or Options X5 and X7 used together, the *Employer* may terminate the *Contractor's* obligation to Provide the Works using the same procedures and payment on termination as those applied for reasons R1 to R15 or R18 stated in the Termination Table.

## Z12 Ethics

For the purposes of this Z-clause, the following definitions apply:

- Affected Party** means, as the context requires, any party, irrespective of whether it is the *Contractor* or a third party, such party's employees, agents, or Subcontractors or Subcontractor's employees, or any one or more of all of these parties' relatives or friends,
- Coercive Action** means to harm or threaten to harm, directly or indirectly, an Affected Party or the property of an Affected Party, or to otherwise influence or attempt to influence an Affected Party to act unlawfully or illegally,
- Collusive Action** means where two or more parties co-operate to achieve an unlawful or illegal purpose, including to influence an Affected Party to act unlawfully or illegally,
- Committing Party** means, as the context requires, the *Contractor*, or any member thereof in the case of a joint venture, or its employees, agents, or Subcontractor or the Subcontractor's employees,
- Corrupt Action** means the offering, giving, taking, or soliciting, directly or indirectly, of a good or service to unlawfully or illegally influence the actions of an Affected Party,
- Fraudulent Action** means any unlawfully or illegally intentional act or omission that misleads, or attempts to mislead, an Affected Party, in order to obtain a financial or other benefit or to avoid an obligation or incurring an obligation,
- Obstructive Action** means a Committing Party unlawfully or illegally destroying, falsifying, altering or concealing information or making false statements to materially impede an investigation into allegations of Prohibited Action, and
- Prohibited Action** means any one or more of a Coercive Action, Collusive Action Corrupt Action, Fraudulent Action or Obstructive Action.

Z12.1 A Committing Party may not take any Prohibited Action during the course of the procurement of this contract or in execution thereof.

Z12.2 The *Employer* may terminate the *Contractor's* obligation to Provide the Services if a Committing Party has taken such Prohibited Action and the *Contractor* did not take timely and appropriate action to prevent or remedy the situation, without limiting any other rights or remedies the *Employer* has. It is not required that the Committing Party had to have been found guilty, in court or in any other similar process, of such Prohibited Action before the *Employer* can terminate the *Contractor's* obligation to Provide the Services for this reason.

Z12.3 If the *Employer* terminates the *Contractor's* obligation to Provide the Services for this reason, the amounts due on termination are those intended in core clauses 92.1 and 92.2.

Z12.4 A Committing Party co-operates fully with any investigation pursuant to alleged Prohibited Action. Where the *Employer* does not have a contractual bond with the Committing Party, the *Contractor* ensures that the Committing Party co-operates fully with an investigation.

## Z13 Insurance

Z 13.1 Replace core clause 84 with the following:

**Insurance cover 84**

- 84.1** When requested by a Party, the other Party provides certificates from his insurer or broker stating that the insurances required by this contract are in force.
- 84.2** The *Contractor* provides the insurances stated in the Insurance Table A.
- 84.3** The insurances provide cover for events which are at the *Contractor's* risk from the *starting date* until the earlier of Completion and the date of the termination certificate.

**INSURANCE TABLE A**

<b>Insurance against</b>	<b>Minimum amount of cover or minimum limit of indemnity</b>
Loss of or damage to the <i>works</i> , Plant and Materials	The replacement cost where not covered by the <i>Employer's</i> insurance  The <i>Employer's</i> policy deductible, as at Contract Date, where covered by the <i>Employer's</i> insurance
Loss of or damage to Equipment	The replacement cost
Liability for loss of or damage to property (except the <i>works</i> , Plant and Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i> ) caused by activity in connection with this contract	<b><u>Loss of or damage to property</u></b> <b><u>Employer's property</u></b> The replacement cost where not covered by the <i>Employer's</i> insurance  The <i>Employer's</i> policy deductible, as at Contract Date, where covered by the <i>Employer's</i> insurance  <b><u>Other property</u></b> The replacement cost  <b><u>Bodily injury to or death of a person</u></b> The amount required by applicable law
Liability for death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract	The amount required by the applicable law

**Z 13.2**

**Replace core clause 87 with the following:**

The *Employer* provides the insurances stated in the Insurance Table B.

**INSURANCE TABLE B**

<b>Insurance against or name of policy</b>	<b>Minimum amount of cover or minimum limit of indemnity</b>
Assets All Risk	Per the insurance policy document
Contract Works insurance	Per the insurance policy document
Environmental Liability	Per the insurance policy document
General and Public Liability	Per the insurance policy document
Transportation (Marine)	Per the insurance policy document
Motor Fleet and Mobile Plant	Per the insurance policy document

Terrorism	Per the insurance policy document
Cyber Liability	Per the insurance policy document
Nuclear Material Damage and Business Interruption	Per the insurance policy document
Nuclear Material Damage Terrorism	Per the insurance policy document

**Z14 Nuclear Liability**

- Z14.1 The *Employer* is the operator of the Koeberg Nuclear Power Station (KNPS), a nuclear installation, as designated by the National Nuclear Regulator of the Republic of South Africa, and is the holder of a nuclear licence in respect of the KNPS.
- Z14.2 The *Employer* is solely responsible for and indemnifies the *Contractor* or any other person against any and all liabilities which the *Contractor* or any person may incur arising out of or resulting from nuclear damage, as defined in Act 47 of 1999, save to the extent that any liabilities are incurred due to the unlawful intent of the *Contractor* or any other person or the presence of the *Contractor* or that person or any property of the *Contractor* or such person at or in the KNPS or on the KNPS site, without the permission of the *Employer* or of a person acting on behalf of the *Employer*.
- Z14.3 Subject to clause Z14.4 below, the *Employer* waives all rights of recourse, arising from the aforesaid, save to the extent that any claims arise or liability is incurred due or attributable to the unlawful intent of the *Contractor* or any other person, or the presence of the *Contractor* or that person or any property of the *Contractor* or such person at or in the KNPS or on the KNPS site, without the permission of the *Employer* or of a person acting on behalf of the *Employer*.
- Z14.4 The *Employer* does not waive its rights provided for in section 30 (7) of Act 47 of 1999, or any replacement section dealing with the same subject matter.
- Z14.5 The protection afforded by the provisions hereof shall be in effect until the KNPS is decommissioned.

**Z15 Asbestos**

For the purposes of this Z-clause, the following definitions apply:

- AAIA** means approved asbestos inspection authority.
- ACM** means asbestos containing materials.
- AL** means action level, i.e. a level of 50% of the OEL, i.e. 0.1 regulated asbestos fibres per ml of air measured over a 4 hour period. The value at which proactive actions is required in order to control asbestos exposure to prevent exceeding the OEL.
- Ambient Air** means breathable air in area of work with specific reference to breathing zone, which is defined to be a virtual area within a radius of approximately 30cm from the nose inlet.
- Compliance Monitoring** means compliance sampling used to assess whether or not the personal exposure of workers to regulated asbestos fibres is in compliance with the Standard's requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos containing material, equipment and articles.
- OEL** means occupational exposure limit.

<b>Parallel Measurements</b>	means measurements performed in parallel, yet separately, to existing measurements to verify validity of results.
<b>Safe Levels</b>	means airborne asbestos exposure levels conforming to the Standard's requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos containing material, equipment and articles.
<b>Standard</b>	means the <i>Employer's</i> Asbestos Standard 32-303: Requirements for Safe Processing, Handling, Storing, Disposal and Phase-out of Asbestos and Asbestos Containing Material, Equipment and Articles.
<b>SANAS</b>	means the South African National Accreditation System.
<b>TWA</b>	means the average exposure, within a given workplace, to airborne asbestos fibres, normalised to the baseline of a 4 hour continuous period, also applicable to short term exposures, i.e. 10-minute TWA.
Z15.1	The <i>Employer</i> ensures that the Ambient Air in the area where the <i>Contractor</i> will Provide the Services conforms to the acceptable prescribed South African standard for asbestos, as per the regulations published in GNR 155 of 10 February 2002, under the Occupational Health and Safety Act, 1993 (Act 85 of 1993) ("Asbestos Regulations"). The OEL for asbestos is 0.2 regulated asbestos fibres per millilitre of air as a 4-hour TWA, averaged over any continuous period of four hours, and the short term exposure limit of 0.6 regulated asbestos fibres per millilitre of air as a 10-minute TWA, averaged over any 10 minutes, measured in accordance with HSG248 and monitored according to HSG173 and OESSM.
Z15.2	Upon written request by the <i>Contractor</i> , the <i>Employer</i> certifies that these conditions prevail. All measurements and reporting are effected by an independent, competent, and certified occupational hygiene inspection body, i.e. a SANAS accredited and Department of Employment and Labour approved AAIA. The <i>Contractor</i> may perform Parallel Measurements and related control measures at the <i>Contractor's</i> expense. For the purposes of compliance the results generated from Parallel Measurements are evaluated only against South African statutory limits as detailed in clause Z15.1. Control measures conform to the requirements stipulated in the AAIA-approved asbestos work plan.
Z15.3	The <i>Employer</i> manages asbestos and ACM according to the Standard.
Z15.4	In the event that any asbestos is identified while Providing the Services, a risk assessment is conducted and if so required, with reference to possible exposure to an airborne concentration of above the AL for asbestos, immediate control measures are implemented and relevant air monitoring conducted in order to declare the area safe.
Z15.5	The <i>Contractor's</i> personnel are entitled to stop working and leave the contaminated area forthwith until such time that the area of concern is declared safe by either Compliance Monitoring or an AAIA approved control measure intervention, for example, per the emergency asbestos work plan, if applicable.
Z15.6	The <i>Contractor</i> continues to Provide the Services, without additional control measures presented, on presentation of Safe Levels. The contractually agreed dates to Provide the Services, including the Completion Date, are adjusted accordingly. The contractually agreed dates are extended by the notification periods required by regulations 3 and 21 of the Asbestos Regulations, 2001.
Z15.7	Any removal and disposal of asbestos, asbestos containing materials and waste, is done by a registered asbestos contractor, instructed by the <i>Employer</i> at the <i>Employer's</i> expense, and conducted in line with South African legislation.

## **Z16 Security Clearance/ Criminal Checks**

These clauses are not only, but are especially, applicable for accessing critical infrastructure in terms of the Critical Infrastructure Protection Act, 2019 (previously referred to as National Key Points), but may include other sites, and/or where persons are rendering a service or have given notice of intention to render a service to an organ of state, which service may (1) give him or her access to classified information and intelligence in the possession of the organ of state; or (2) give him or her access to or information concerning areas designated as critical infrastructure.

- Z16.1** The *Contractor* and its subcontractors implement risk and security management processes and measures to mitigate any threats against any premises, installations or sites, systems, or information of the *Employer* with only persons with criminal verification record security clearance certificates being given access after verification of these and identifying documents by the *Employer's* security system.
- Z16.2** The *Contractor* provides, at the *Contractor's* cost, to the *Employer*, criminal verification record security clearance certificates for each person the *Contractor* or its subcontractors requires to access any premises, installations or sites, systems, or information of the *Employer*, with copies of their identifying documents, such as passports, before allowed such access by the *Employer*. The *Employer's* refusal to allow access to premises, installations or site/s, systems or information is at the *Employer's* sole discretion and is not a compensation event.
- Z16.3** The criminal verification record security clearance certificates provided are to have been issued by a service provider which is to be a reputable screening company accredited by the South African Police Services, are to be no older than four weeks since issue and valid for as long as each person is required to access premises, installations or sites, systems or information. The *Employer* may require updated certificates and identifying documents every 26 to 52 weeks, subject to safety and security concerns and the risk rating of the works or services undertaken and/or premises, installations or sites, systems or information.
- Z16.4** If any such criminal verification record security clearance certificates is cancelled, withdrawn, invalidated, amended, or expires, or a criminal conviction is noted against any person requiring access, even if an appeal against the criminal conviction has been noted, the *Service Manager* may instruct the *Contractor* to ensure that such person leaves the premises, installations or site/s and is blocked from systems and information and the giving of this instruction is not a compensation event.

## **Z17 Protection of Personal Information Act Compliance**

- Z17.1** For the purposes of this clause, the terms "Data Subject", "Personal Information", "Processing" and "Regulator" and "Responsible Party" have the meanings given to them in the Protection of Personal Information Act, 2013 ("POPIA").
- Z17.2** Each Party acknowledges that it is an independent Responsible Party in relation to the Personal Information processed in terms of this contract ("Shared Personal Information") and that it determines the purposes for which and the manner in which the Shared Personal Information is, or is to be, processed.
- Z17.3** Each Party shall always comply with POPIA when performing its obligations under this contract and shall not perform any of their respective obligations under this contract in such a way as to cause the other Party to breach any of that other Party's obligations under POPIA.
- Z17.4** Each Party shall ensure that, in respect of all Shared Personal Information provided to the other Party and in respect of the use of that Shared Personal Information under this contract:-
- Z17.4.1** all necessary fair Processing notices have been provided to and consents obtained from Data Subjects by that Party, where required, in terms of POPIA, including to specify that the other Party is also a Responsible Party in respect of the Data Subject's Personal

Information and to provide a link (for example, <https://www.eskom.co.za/about-eskom/website-terms-and-conditions/> ) to the other Party's Privacy Statement or to include a statement that the other Party's Privacy Statement can be found on the other Party's corporate website; and

Z17.4.2 all necessary steps have been taken to ensure that Shared Personal Information has been collected and processed in accordance with the principles set out in POPIA, including in particular those relating to:

- lawful, fair and transparent Processing;
- specified, legitimate and explicit purposes of Processing; and
- adequate, relevant and not excessive Processing.

Z17.5 If either Party receives any complaint, notice or communication from the Regulator which relates directly to:

Z17.5.1 the other Party's Processing of the Shared Personal Data; or

Z17.5.2 a potential failure by the other Party to comply with POPIA in respect of the activities of the Parties under or in connection with this contract,

it shall, to the extent permitted by law, promptly notify the other Party and provide such information as it shall reasonably request in that regard.

Z17.6 If a Data Subject makes a written request to either Party to exercise any of their rights under POPIA, the receiving Party shall respond to that request in accordance with POPIA. To the extent the request concerns Processing of Shared Personal Information undertaken by the other Party, the receiving Party shall:

Z17.6.1 promptly and without undue delay forward the request to the other Party; and

Z17.6.2 cooperate and provide reasonable assistance in relation to that request to enable the other Party to respond in accordance with POPIA.

Z17.7 Each Party acknowledges that the other Party may disclose Shared Personal Information to any Regulator or law enforcement authority with jurisdiction to request access to the Shared Personal Information.

Z17.8 Neither Party discloses or otherwise makes available the Personal Information to any third party (including sub-contractors, but excluding its authorised employees who require access to such Personal Information strictly in order for the Parties to carry out their obligations pursuant to this contract), unless a Party has provided, to a requesting Party, its prior written consent to do so, and the requesting Party has submitted to the other Party (consenting Party), to its satisfaction, a copy of a written contract or undertaking that the requesting Party has entered into with a third party for the protection of Personal Information of the Data Subjects or unless there is an applicable exemption in terms of the law to process or further process the personal information.

Z17.9 The requesting Party indemnifies and holds harmless the consenting Party and its staff, successors, cessionaries, delegates, and assigns, from any and all losses, costs, expenses and damage, as well as penalties and fines arising from the requesting Party's non-compliance with the provision of any relevant legislation applicable to Personal Information or data protection, as well as damage to the consenting Party's reputation and costs of compliance as directed by the Regulator, including but not limited to publication of the data breach.

**Annexure A: One-in-ten-year-return weather data obtained from SA Weather Bureau for [weather station]**

If any one of these *weather measurements* recorded within a calendar month, before the Completion Date for the whole of the *works* and at the place stated in this Contract Data is shown to be more adverse than the amount stated below then the *Contractor* may notify a compensation event.

Month	Weather measurement					Total weather allowance 40% overlap
	Cumulative rainfall (mm)	Number of days with rain more than 10mm	Number of days with min air temp < 0 deg.C	Number of days with snow lying at 08:00 CAT	Number of days with wind > 5.5 m/s	
January	113.4	3.6	0.0	0	2.2	3.5
February	80.5	2.8	0.0	0	0.6	2.1
March	37.0	0.8	0.0	0	1.1	1.1
April	56.2	1.9	0.2	0	0.9	1.8
May	9.8	0.2	3.2	0	1.1	2.7
June	7.3	0.3	14.7	0	1.6	9.9
July	0.8	0	14.6	0	2.0	9.9
August	4.8	0	4.8	0	3.6	5.0
September	23.3	0.8	0.4	0	4.7	3.6
October	63.4	2.4	0.0	0	5.3	4.6
November	82.0	2.7	0.0	0	5.6	5.0
December	139.3	4.7	0.0	0	2.8	4.5

Only the difference between the more adverse recorded weather and the equivalent measurement given above is taken into account in assessing a compensation event.

## C1.2 Contract Data

### Part two - Data provided by the *Contractor*

#### Notes to a tendering contractor:

Please read both the NEC3 Engineering and Construction Contract (April 2013) and the relevant parts of its Guidance Notes (ECC3-GN)<sup>2</sup> in order to understand the implications of this Data which the tenderer is required to complete. An example of the completed Data is provided on pages 156 to 158 of the ECC3 (April 2013) Guidance Notes.

The number of the clause which requires the data is shown in the left-hand column for each statement however other clauses may also use the same data

Where a form field like this [ ] appears, data is required to be inserted relevant to the option selected. Click on the form field **once** and type in the data. Otherwise, complete by hand and in ink.

Completion of the data in full, according to Options chosen, is essential to create a complete contract.

Clause	Statement	Data
10.1	The <i>Contractor</i> is (Name): Address Tel No. Fax No.	
11.2(8)	The <i>direct fee percentage</i> is The <i>subcontracted fee percentage</i> is	% %
11.2(18)	The <i>working areas</i> are the Site and	
24.1	The <i>Contractor's</i> key persons are: 1 Name: Job: Responsibilities: Qualifications: Experience: 2 Name: Job Responsibilities: Qualifications: Experience:	

<sup>2</sup> Available from Engineering Contract Strategies Tel 011 803 3008, Fax 011 803 3009 or see [www.ecs.co.za](http://www.ecs.co.za)

		<b>CV's (and further key persons data including CVs) are appended to Tender Schedule entitled .</b>		
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	TBC		
11.2(14)	The following matters will be included in the Risk Register	Site access restrictions or shutdowns (operational plant interface)		
31.1	The programme identified in the Contract Data is	To be accepted by the Project manager		
<b>A</b>	<b>Priced contract with activity schedule</b>			
11.2(20)	The <i>activity schedule</i> is in	<b>(in figures)</b> <b>(in words), excluding VAT</b>		
11.2(30)	The tendered total of the Prices is			
	Data for Schedules of Cost Components	<i>Note "SCC" means Schedule of Cost Components starting on page 60, and "SSCC" means Shorter Schedule of Cost Components starting on page 63 of ECC3 (April 2013).</i>		
<b>A</b>	<b>Priced contract with activity schedule</b>	<b>Data for the Shorter Schedule of Cost Components</b>		
41 in SSCC	The percentage for people overheads is:	%		
21 in SSCC	The published list of Equipment is the last edition of the list published by  The percentage for adjustment for Equipment in the published list is	<b>Minus</b> %		
22 in SSCC	The rates of other Equipment are:	<b>Equipment</b>	<b>Size or capacity</b>	<b>Rate</b>
61 in SSCC	The hourly rates for Defined Cost of design outside the Working Areas are  <b>Note: Hourly rates are estimated 'cost to company of the employee' and not selling rates.</b>  <b>Please insert another schedule if foreign resources may also be used</b>	<b>Category of employee</b>		<b>Hourly rate</b>

ESKOM HOLDINGS SOC LTD.  
PROJECT & CONTRACT TITLE  
LETHABO POWER STATION LOADING OF SRO CIP CHEMICALS

CONTRACT NUMBER \_\_\_\_\_

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## C1.3 Forms of Securities

### Pro formas for Bonds & Guarantees

For use with the NEC3 Engineering & Construction Contract

The *conditions of contract* stated in the Contract Data Part 1 include the following Secondary Options:

Option X4: Parent company guarantee  
Option X13: Performance Bond

Each of these secondary Options requires a bond or guarantee “in the form set out in the Works Information”. Pro forma documents for these bonds and guarantees are provided here for convenience but are to be treated as part of the Works Information.

Option X16: Retention (not used with Option F)

The *Contractor* may provide a Retention Money Guarantee in the form stated here. When the *Employer* receives and accepts a Retention Money Guarantee exactly in the form stated he will instruct the *Project Manager* not to assess any amount be retained in terms of secondary Option X16.

The *Contractor* shall guarantee his SDL&I Obligations by providing the *Employer* with an SDL&I Guarantee in the form provided here.

The organisation providing the bond / guarantee does so by copying the pro forma document onto his letterhead without any change to the text or format and completing the required details. The completed document is then given to the *Employer* within the time stated in the contract.

**Pro forma Parent Company Guarantee (for use with Option X4)**

*(to be reproduced exactly as shown below on the letterhead of the Contractor's Parent Company)*

**Eskom Holdings SOC Ltd  
Megawatt Park  
Maxwell Drive  
Sandton  
Johannesburg**

Date:

Dear Sirs,

Parent Company Guarantee for Contract No

With reference to the above numbered contract made or to be made between

**Eskom Holdings SOC Ltd** (the *Employer*) and  
**{Insert registered name and address of the Contractor}** (the *Contractor*), for  
**{Insert details of the works from the Contract Data}** (the *works*).

I/We the undersigned

on behalf of the *Contractor's*  
parent company

of physical address

and duly authorised thereto do hereby unconditionally guarantee to the *Employer* that the *Contractor* shall Provide the Works in accordance with the above numbered Contract.

If for any reason the *Contractor* fails to Provide the Works, we hereby agree to cause to Provide the Works at no additional cost to the *Employer*.

If we fail to comply with the terms of this Deed of Guarantee, the *Employer* may itself procure such performance (whether or not the Agreement be formally determined). The *Employer* is to notify us and we shall indemnify the *Employer* for any additional cost or expense it incurs.

Our liability shall be as primary obligor and not merely as surety and shall not be impaired or discharged by reason of any arrangement or change in relationship made between the *Contractor* and the *Employer* and/or between us and *Contractor*; nor any alteration in the obligations undertaken by the *Contractor* or in the terms of the Agreement; nor any indulgence, failure, delay by you as to any matter; nor any dissolution or liquidation or such other analogous event of the *Contractor*.

The *Employer* shall not be obliged before taking steps to enforce the terms of this Deed of Guarantee to obtain judgement against the *Contractor* in any court or other tribunal, to make or file any claim in liquidation (or analogous proceedings) or to seek any remedy or proceed first against the *Contractor*.

This Deed of Guarantee shall be governed by and construed in accordance with the laws of the Republic of South Africa and we hereby submit to the non-exclusive jurisdiction of the High Court of South Africa.

LETHABO POWER STATION LOADING OF SRO CIP CHEMICALS

Signed at \_\_\_\_\_ on this \_\_\_\_\_ day of \_\_\_\_\_ 200\_

Signature(s)

Name(s) (printed)

Position in parent company

Signature of Witness(s)

Name(s) (printed)


**Pro forma Performance Bond – Demand Guarantee (for use with Option X13)**  
(to be reproduced exactly as shown below on the letterhead of the Contractor's Parent Company)

**Eskom Holdings SOC Ltd**  
**Megawatt Park**  
**Maxwell Drive**  
**Sandton**  
**Johannesburg**

Date:

Dear Sirs

Reference No. [●] [Drafting Note: Bank reference number to be inserted]

**Performance Bond – Demand Guarantee:** [Drafting Note: Name of Contractor to be inserted]

Project [ ] Contract Reference: ..... [Drafting Note: Contractor contract reference number to be inserted]

In this Guarantee the following words and expressions shall have the following meanings:-

“Bank” - means [●], [●] Branch, (Registration No. [●]); [Drafting Note: Name of Bank to be inserted]

“Bank’s Address” - means [●]; [Drafting Note: Bank’s physical address to be inserted]

“Contract” – means the written agreement relating to the Project, entered into between Eskom and the Contractor, on or about the [●] day of [●] 200[●] (Contract Reference No. [.]as amended, varied, restated, novated or substituted from time to time; [Drafting Note: Signature Date and Contract reference number to be inserted]

“Contractor” – means [●] a company registered in accordance with the laws of [●] under Registration Number [●]. [Drafting Note: Name and details of Contractor to be inserted]

“Eskom” - means Eskom Holdings SOC Ltd, a company registered in accordance with the laws of the Republic of South Africa under Registration Number 2002/015527/30].

“Expiry Date” - means the date on which the Defects Certificate is issued in terms of the Contract.

“Guaranteed Sum” - means the sum of R [●] ([●] Rand);

“Project” - means [insert if applicable.].

At the instance of the Contractor, we the undersigned \_\_\_\_\_ and \_\_\_\_\_, in our respective capacities as \_\_\_\_\_ and \_\_\_\_\_ of the Bank, and duly authorized thereto, confirm that we hold the Guaranteed Sum at the disposal of Eskom, as security for the proper performance by the Contractor of all of its obligations in terms of and arising from the Contract and hereby undertake to pay to Eskom, on written demand from Eskom received prior to the Expiry Date, any sum or sums not exceeding in total the Guaranteed Sum.

A demand for payment under this guarantee shall be made in writing at the Bank’s address and shall:

be signed on behalf of Eskom by a Group Executive, Divisional Executive, Senior General Manager, General Manager or its delegate;

state the amount claimed (“the Demand Amount”);

state that the Demand Amount is payable to Eskom in the circumstances contemplated in the Contract.

Notwithstanding the reference herein to the Contract the liability of the Bank in terms hereof is as principal and not as surety and the Bank’s obligation/s to make payment:

is and shall be absolute provided demand is made in terms of this bond in all circumstances; and

LETHABO POWER STATION LOADING OF SRO CIP CHEMICALS

is not, and shall not be construed to be, accessory or collateral on any basis whatsoever.

The Bank's obligations in terms of this Guarantee:

shall be restricted to the payment of money only and shall be limited to the maximum of the Guaranteed Sum; and

shall not be discharged and compliance with any demand for payment received by the Bank in terms hereof shall not be delayed, by the fact that a dispute may exist between Eskom and the Contractor.

Eskom shall be entitled to arrange its affairs with the Contractor in any manner which it sees fit, without advising us and without affecting our liability under this Guarantee. This includes, without limitation, any extensions, indulgences, release or compromise granted to the Contractor or any variation under or to the Contract.

Should Eskom cede its rights against the Contractor to a third party where such cession is permitted under the Contract, then Eskom shall be entitled to cede to such third party the rights of Eskom under this Guarantee on written notification to the Bank of such cession.

This Guarantee:

shall expire on the Expiry Date until which time it is irrevocable;

is, save as provided for in 0 above, personal to Eskom and is neither negotiable nor transferable;

shall be returned to the Bank upon the earlier of payment of the full Guaranteed Sum or expiry hereof;

shall be regarded as a liquid document for the purpose of obtaining a court order; and

shall be governed by and construed in accordance with the law of the Republic of South Africa and shall be subject to the jurisdiction of the Courts of the Republic of South Africa.

Any claim which arises or demand for payment received after expiry date will be invalid and unenforceable.

The Bank chooses domicilium citandi et executandi for all purposes in connection with this Guarantee at the Bank's Address.

Signed at \_\_\_\_\_

Date \_\_\_\_\_

For and behalf of the Bank

Bank Signatory: \_\_\_\_\_

Bank Signatory: \_\_\_\_\_

Witness: \_\_\_\_\_

Witness: \_\_\_\_\_

Bank's seal or stamp

**Pro forma Retention Money Guarantee (may be used when Option X16 applies)**  
*(to be reproduced exactly as shown below on the letterhead of the Bank providing the Guarantee)*

**Eskom Holdings SOC Limited**  
**Megawatt Park**  
**Maxwell Drive**  
**Sandton**  
**Johannesburg**

Date:

Dear Sirs

Reference No. [●] *[Drafting Note: Bank reference number to be inserted]*

**Retention Money Guarantee:** *[Drafting Note: Name of Contractor to be inserted]*

Project [ ] : Contract Reference: *[Drafting Note: Contractor contract reference number to be inserted]*

In this Guarantee the following words and expressions shall have the following meanings:-

“Bank” - means [●], [●] Branch, (Registration No. [●]); *[Drafting Note: Name of Bank to be inserted]*

“Bank’s Address” - means [●]; *[Drafting Note: Bank’s physical address to be inserted]*

“Contract” – means the written agreement relating to the Project, entered into between Eskom and the Contractor, on or about the [●] day of [●] 200[●] (Contract Reference No. .... as amended, varied, restated, novated or substituted from time to time; *[Drafting Note: Signature Date and Contract reference number to be inserted]*

“Contractor” – means [●] a company registered in accordance with the laws of [●] under Registration Number [●]. *[Drafting Note: Name and details of Contractor to be inserted]*

“Eskom” - means Eskom Holdings SOC Limited, a company registered in accordance with the laws of the Republic of South Africa under Registration Number 2002/015527/30

“Expiry Date” - means the date on which the Defects Certificate is issued in terms of the Contract.

“Guaranteed Sum” - means the sum of R [●] ([●] Rand); *[Drafting Note: Insert amount of Retention Money Guarantee.]*

“Project” - means the.....

At the instance of the Contractor, we the undersigned \_\_\_\_\_ and \_\_\_\_\_, in our respective capacities as \_\_\_\_\_ and \_\_\_\_\_ of the Bank, and duly authorized thereto, confirm that we hold the Guaranteed Sum at the disposal of Eskom, as security for the proper performance by the Contractor of all of its obligations in terms of and arising from the Contract and hereby undertake to pay to Eskom, on written demand from Eskom received prior to the Expiry Date, any sum or sums not exceeding in total the Guaranteed Sum.

A demand for payment under this guarantee shall be made in writing at the Bank’s address and shall:

be signed on behalf of Eskom by a director of Eskom or his authorised delegate.

state the amount claimed (“the Demand Amount”);

state that the Contractor has failed to carry out his obligation(s) to rectify certain defect(s) for which he is responsible under the Contract (and the nature of such defect(s)) alternatively that the Demand Amount is payable to Eskom in the circumstances contemplated in the Contract.

Notwithstanding the reference herein to the Contract the liability of the Bank in terms hereof is as principal and not as surety and the Bank’s obligation/s to make payment:

LETHABO POWER STATION LOADING OF SRO CIP CHEMICALS

is and shall be absolute provided demand is made in terms of this bond in all circumstances; and

is not, and shall not be construed to be, accessory or collateral on any basis whatsoever.

The Bank's obligations in terms of this Guarantee:

shall be restricted to the payment of money only and shall be limited to the maximum of the Guaranteed Sum; and

shall not be discharged and compliance with any demand for payment received by the Bank in terms hereof shall not be delayed by the fact that a dispute may exist between Eskom and the Contractor.

Eskom shall be entitled to arrange its affairs with the Contractor in any manner which it sees fit, without advising us and without affecting our liability under this Guarantee. This includes, without limitation, any extensions, indulgences, release or compromise granted to the Contractor or any variation under or to the Contract.

Should Eskom cede its rights against the Contractor to a third party where such cession is permitted under the Contract, then Eskom shall be entitled to cede to such third party the rights of Eskom under this Guarantee on written notification to the Bank of such cession.

This Guarantee:

shall expire on the Expiry Date until which time it is irrevocable;

is, save as provided for in 0 above, personal to Eskom and is neither negotiable nor transferable;

shall be returned to the Bank upon the earlier of payment of the full Guaranteed Sum or expiry hereof;

shall be regarded as a liquid document for the purpose of obtaining a court order; and

shall be governed by and construed in accordance with the law of the Republic of South Africa and shall be subject to the jurisdiction of the Courts of the Republic of South Africa.

Any claim which arises or demand for payment received after expiry date will be invalid and unenforceable.

The Bank chooses domicilium citandi et executandi for all purposes in connection with this Guarantee at the Bank's Address.

Signed at \_\_\_\_\_

Date \_\_\_\_\_ Bank's seal or stamp

For and behalf of the Bank

Bank Signatory: \_\_\_\_\_

Bank Signatory: \_\_\_\_\_

Witness: \_\_\_\_\_

Witness: \_\_\_\_\_

**Pro forma SDL&I Guarantee**

*(to be reproduced exactly as shown below on the letterhead of the Bank providing the Guarantee)*

**Eskom Holdings Limited  
Megawatt Park  
Maxwell Drive  
Sandton  
Johannesburg**

Date:

Dear Sirs

Reference No. [●] *[Drafting Note: Bank reference number to be inserted]*

**Pro-Forma SDL&I Guarantee:** *[Drafting Note: Name of Contractor to be inserted]*

Project [ ] Contract Reference: [●] *[Drafting Note: Contractor contract reference number to be inserted]*

In this Guarantee the following words and expressions shall have the following meanings:-

“Bank” - means [●], [●] Branch, (Registration No. [●]); *[Drafting Note: Name of Bank to be inserted]*

“Bank’s Address” - means [●]; *[Drafting Note: Bank’s physical address to be inserted]*

“Contract” – means the written agreement relating to the Project, entered into between the *Employer* and the *Contractor*, on or about the [●] day of [●] 200[●] (Contract Reference No. [●] as amended, varied, restated, novated or substituted from time to time; *[Drafting Note: Signature Date and Contract reference number to be inserted]*

“*Contractor*” – means [●] a company registered in accordance with the laws of [●] under Registration Number [●]. *[Drafting Note: Name and details of Contractor to be inserted]*

“*Contractor’s* SDL&I Obligations” – means the *Contractor’s* SDL&I Obligations under and as defined in the Contract.

“*Employer*” - means Eskom Holdings Limited, a company registered in accordance with the laws of the Republic of South Africa under Registration Number 2002/015527/06.

“Expiry Date” - means the [●] day of [●] 200[●]; *[Drafting Note: anticipated date of issue of SDL&I Performance Certificate to be inserted.]*

“Guaranteed Sum” - means the sum of R [●] ([●] Rand);

“Project” – means the .....

At the instance of the *Contractor*, we the undersigned \_\_\_\_\_ and \_\_\_\_\_, in our respective capacities as \_\_\_\_\_ and \_\_\_\_\_ of the Bank, and duly authorized thereto, confirm that we hold the Guaranteed Sum at the disposal of the *Employer*, as security for the proper performance by the *Contractor* of the *Contractor’s* SDL&I Obligations and hereby undertake to pay to the *Employer*, on written demand from the *Employer* received prior to the Expiry Date, any sum or sums not exceeding in total the Guaranteed Sum.

A demand for payment under this guarantee shall be made in writing at the Bank’s address and shall:

state the amount claimed (“the Demand Amount”);

state that the Demand Amount is payable to the *Employer* in the circumstances contemplated in the Contract.

Notwithstanding the reference herein to the Contract the liability of the Bank in terms hereof is as principal and not as surety and the Bank’s obligation/s to make payment:

LETHABO POWER STATION LOADING OF SRO CIP CHEMICALS

is and shall be absolute provided demand is made in terms of this bond in all circumstances; and is not, and shall not be construed to be, accessory or collateral on any basis whatsoever.

The Bank's obligations in terms of this Guarantee:

shall be restricted to the payment of money only and shall be limited to the maximum of the Guaranteed Sum; and

shall not be discharged and compliance with any demand for payment received by the Bank in terms hereof shall not be delayed, by the fact that a dispute may exist between the *Employer* and the *Contractor*.

The *Employer* shall be entitled to arrange its affairs with the *Contractor* in any manner which it sees fit, without advising us and without affecting our liability under this Guarantee. This includes, without limitation, any extensions, indulgences, release or compromise granted to the *Contractor* or any variation under or to the Contract.

Should the *Employer* cede its rights against the *Contractor* to a third party where such cession is permitted under the Contract, then the *Employer* shall be entitled to cede to such third party the rights of the *Employer* under this Guarantee on written notification to the Bank of such cession.

This Guarantee:

shall expire on the Expiry Date until which time it is irrevocable;

is, save as provided for in 0 above, personal to the *Employer* and is neither negotiable nor transferable;

shall be returned to the Bank upon the earlier of payment of the full Guaranteed Sum or expiry hereof;

shall be regarded as a liquid document for the purpose of obtaining a court order; and

shall be governed by and construed in accordance with the law of the Republic of South Africa and shall be subject to the jurisdiction of the courts of the Republic of South Africa.

Any claim which arises or demand for payment received after expiry date will be invalid and unenforceable.

The Bank chooses domicilium citandi et executandi for all purposes in connection with this Guarantee at the Bank's Address.

Signed at \_\_\_\_\_

Date \_\_\_\_\_

For and behalf of the Bank

Bank Signatory: \_\_\_\_\_

Bank Signatory: \_\_\_\_\_

Witness: \_\_\_\_\_

Witness: \_\_\_\_\_

Bank's seal or stamp

Part 2: Pricing Data  
**ECC3 Option A**

<b>Document reference</b>	<b>Title</b>	<b>No of pages</b>
C2.1	Pricing assumptions: Option A	
C2.2	The <i>activity schedule</i>	

## C2.1 Pricing assumptions: Option A

How work is priced and assessed for payment

Clause 11 in NEC3 Engineering and Construction Contract, (ECC3) Option A states:

<b>Identified and defined terms</b>	11 11.2	(20) The Activity Schedule is the <i>activity schedule</i> unless later changed in accordance with this contract.  (27) The Price for Work Done to Date is the total of the Prices for each group of completed activities and each completed activity which is not in a group.  A completed activity is one which is without Defects which would either delay or be covered by immediately following work.  (30) The Prices are the lump sum prices for each of the activities on the Activity Schedule unless later changed in accordance with this contract.
-------------------------------------	------------	--

This confirms that Option A is a lump sum form of contract where the work is broken down into activities, each of which is priced by the tendering contractor as a lump sum. Only completed activities are assessed for payment at each assessment date; no part payment is made if the activity is not completed by the assessment date.

Function of the Activity Schedule

Clause 54.1 in Option A states: "Information in the Activity Schedule is not Works Information or Site Information". This confirms that specifications and descriptions of the work or any constraints on how it is to be done are not included in the Activity Schedule but in the Works Information. This is further confirmed by Clause 20.1 which states, "The *Contractor* Provides the Works in accordance with the Works Information". Hence the *Contractor* does **not** Provide the Works in accordance with the Activity Schedule. The Activity Schedule is only a pricing document.

Link to the programme

Clause 31.4 states that "The *Contractor* provides information which shows how each activity on the Activity Schedule relates to the operations on each programme which he submits for acceptance". Ideally the tendering contractor will develop a high level programme first then resource each activity and thus arrive at the lump sum price for that activity both of which can be entered into the *activity schedule*.

Preparing the activity schedule

Generally it is the tendering contractor who prepares the *activity schedule* by breaking down the work described within the Works Information into suitable activities which can be well defined, shown on a programme and priced as a lump sum.

The *Employer*, in his Instructions to Tenderers or in a Tender Schedule, may have listed some items that he requires the *Contractor* to include in his *activity schedule* and be priced accordingly.

It is assumed that in preparing his *activity schedule* the *Contractor*:

- Has taken account of the guidance given in the ECC3 Guidance Notes pages 19 and 20;
- Understands the function of the Activity Schedule and how work is priced and paid for;
- Is aware of the need to link the Activity Schedule to activities shown on his programme;
- Has listed and priced activities in the *activity schedule* which are inclusive of everything necessary and incidental to Providing the Works in accordance with the Works Information, as it was at the time of tender, as well as correct any Defects not caused by an *Employer's* risk;
- Has priced work he decides not to show as a separate activity within the Prices of other listed activities in order to fulfil the obligation to complete the *works* for the tendered total of the Prices.
- Understands there is no adjustment to the lump sum Activity Schedule price if the amount, or quantity, of work within that activity later turns out to be different to that which the *Contractor* estimated at time of tender.
- The only basis for a change to the Prices is as a result of a compensation event.

## **C2.2 the *activity schedule***

Use this page as a cover page to the *Contractor's activity schedule*.

Item	Description/Functional Area	Unit	Quantity	Rate	Total Cost
<b>1</b>	<b>PRELIMINARIES AND GENERAL</b>				
1.1	Preliminaries	Sum	1		
<u>1.2</u>	<u>Submission and Approval of Health &amp; Safety file</u>	Sum	1		
<u>1.3</u>	<u>Site Establishment</u>	Sum	1		
<u>1.4</u>	<u>De- Establishment</u>	Sum	1		
<b>2</b>	<b>DESIGN</b>				
<b>2.1</b>	Detailed design certified by- Civil, Mechanical, Electrical and C&I Engineers (Registered ECSA engineers)	Sum	1		
<b>3</b>	<b>CIVIL WORKS</b>				
3.1.1	Breakdown existing concrete slab	Sum	1		
3.1.2	Removal of existing paving to allow for concrete plinths	Sum	1		
3.1.3	Repairs or existing paving around new plinths	Sum	1		
3.1.4	Excavate for foundation	Sum	1		
3.1.5	Construct 15MPa Blinding layer	Sum	1		
3.1.6	Construct 35MPa concrete for bund wall	Sum	1		
3.1.7	Construct 35MPa for concrete plinth	Sum	1		
3.1.8	Supply materials for Formwork	Sum	1		
3.1.9	Supply and usage of Mild and high tensile reinforcing steel	Sum	1		
3.1.10	Supply and installation of Grating Covers	Sum	1		
3.1.11	Supply, casting, curing, and testing of concrete test cubes for compressive strength as per relevant standards and project specifications, including transportation to approved testing lab and submission of test reports.	Sum	1		
3.1.12	Application of screed including application of epoxy coat on screeds	Sum	1		
3.1.13	Supply and installation of One (1) Chemical submersible drainage sump	Sum	1		
<b>4</b>	<b>MECHANICAL WORKS</b>				
4.1	Supply, installation, and testing of mechanical piping works including welding, fasteners and flanges and gaskets where required	Sum	1		
4.2	Supply and installation of Structural steel pipe supports including all required accessories	Sum	1		
4.3	Supply and Installation of One (1) Eductor	Sum	1		

<b>5</b>	<b>ELECTRICAL WORKS</b>				
5.1	Test and decommissioning of existing electrical cables including the removal of associated accessories	Sum	1		
5.2	Supply, installation, testing, and commissioning of new electrical system with associated accessories for the SRO CIP project, as per the approved design and applicable standards.	Sum	1		
<b>6</b>	<b>C&amp;I</b>				
6.1	Supply and installation of Three (3) Pressure gauges as per the approved design and applicable standards.	Sum	1		
6.2	Labelling & coding as per the applicable Lethabo standards.	Sum	1		
<b>7</b>	<b>COMPLIANCE AND PROTECTION</b>				
7.1	Earthing and lightning protection	Sum	1		
7.3	Testing and Commissioning of the whole system	Sum	1		
7.4	Training of 26 personnels	Sum	1		
	<b>FINAL COSTS EXCL.VAT</b>				

### Part 3: Scope of Work

Document reference	Title	No of pages
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C3.2	<i>Contractor's Works Information</i>	
Total number of pages		

# C3.1: Employer's works Information

## C3.1: EMPLOYER'S WORKS INFORMATION

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## **1. Description of the works**

### **1.1 Executive overview**

The desalination plant at Lethabo Power Station is designed to desalinate 500 m<sup>3</sup>/h of cooling water with the feed to the plant coming from the effluent concentration plant (ECP) sump. The desalination process consists of an ultrafiltration (UF) process, and a reverse osmosis (RO) process.

During UF and RO operations, the membranes can foul or scale which results in deterioration of the performance of the plant. Consequently, chemical cleaning of the membranes is required to periodically remove foulants/scale from the membrane surface, and thus restore the performance of the membrane as close as possible to its original performance. The Clean In Place (CIP) system is utilized for this purpose.

The CIP system consists of a CIP tank in which the CIP chemicals are made up by plant personnel. The plant operators carry the bags of dry CIP chemicals up a flight of stairs in order to offload at the top of the CIP tank. During the process of ascending and descending the stairs, the plant personnel risk getting injured while carrying the hazardous CIP chemicals. The CIP makeup system needs to be upgraded in order to assist the operators to operate the system in a safe manner with as little manual handling as possible.

The Works Info includes the following engineering design information:

- Design Assumptions Requirements for the Eductor system
- Process Flow Diagrams
- Process and Instrumentation Diagrams
- Process Descriptions and philosophies
- Layout Interface
- Method Statements

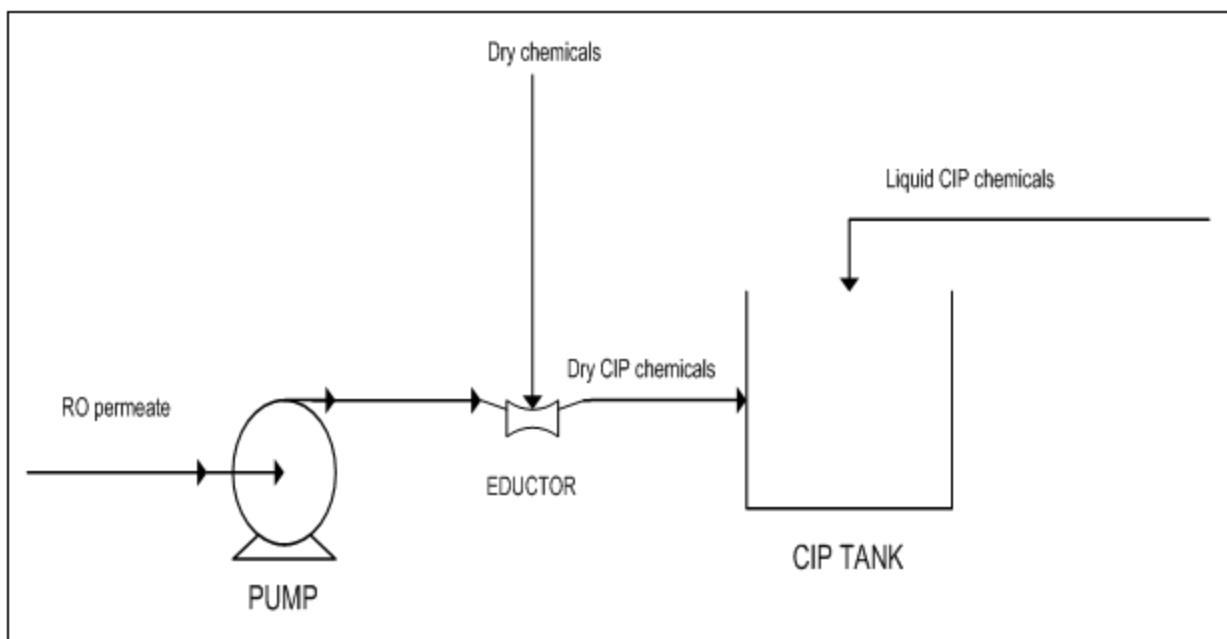
This Scope is inclusive of all activities necessary to address the addition of the Eductor System and ancillary equipment. The Contractor designs, manufactures, procures, installs, and commissions all Mechanical, Structural and Civil work, Electrical, Control & Instrumentation and supplies Equipment and Material required for the works as defined in this Works Information. This includes interfacing with and utilisation of existing plant and equipment and training of Eskom resources who will be impacted by the project

### **1.2 Employer's objectives and purpose of the works**

The purpose of this project is to design, supply and install an eductor system on the Spiral Reverse Osmosis Chemical Cleaning in Place (CIP) system. The inclusion of this eductor system will reduce the impact on human life by minimising manual labour and increasing safe usage and offloading of chemicals for the system chemical cleans. The high-level scope of this project is applicable to the Spiral Reverse Osmosis (SRO) CIP system at Lethabo Power Station.

**The high-level scope of this project:**

- (1) The Contractor will be responsible for the detail design, manufacturing, supply, installation, quality assurance, commissioning and handover associated to this project as stated in the scope of work.
- (2) Detail design to be reviewed and accepted by the Employer.
- (3) Contractor site establishment to commence once the detail design is accepted and the project is ready for execution.
- (4) The Contractor will ensure that all waste generated during the execution phase of the project will be managed in accordance with Lethabo Power Station's existing waste management process.
- (5) The Contractor will be responsible alongside the Employer's representatives for, Factory Acceptance Testing (FAT) (only applicable in the event that pumps are required), Site Integration Testing (SIT) and Commissioning of the new plant installations.
  - a. The Contractor conducts a FAT in the event that a pump is required to fulfil the works and the FAT will be conducted before installation in the presence of the Employer's representatives.
  - b. The Contractor conducts a SIT (upon successful completion of the FAT) at Lethabo Power Station in order to prove the plant provided prior to connecting to the process. The Contractor provides a SIT procedure (including all tests to be performed) to the Employer for acceptance prior
  - c. The Contractor will continue with commissioning after successful completion of the SIT.
  - d. The Contractor will provide all procedures, test/commissioning reports and certificates as per Appendix 1 – VDSS
- (6) The Contractor will provide the Employer with all relevant documentation applicable to the new installations as stated in this document.



**Figure 1: Schematic Eductor System Design**

### 1.3 Process plant operating philosophy

According to the red-lined P&ID 23.63/54809, the operating philosophy of the CIP offloading and cleaning will not change as much as there are no major changes in the process. The CIP solution is pumped to the RO membranes with supply from the product side, and exits the modules on the filter feed side and back to the CIP tank (00UN40G001). Apart from dissolving foulants on the surface of the membranes and in the shell, this procedure has the added advantage of being a back wash and CIP in one, thus resulting in a more effective cleaning of the system.

Before the offloading and preparation of the CIP chemicals, the educator has to be flushed by running the RO permeate through the educator. This will ensure that any leftover chemical particles from the previous CIP are flushed out to the drain. This flushing procedure can be done at any time during the makeup process if blockage issues are encountered.

Ensure that the skid to undergo CIP is offline and that no other UF or RO skid is currently in CIP mode. A level transmitter (00UN40L003) prevents overfilling of the CIP tank. The mixer on the CIP tank (00UN40D002) ensures complete mixing of the CIP chemicals and water, and stops on low level when the CIP tank has been pumped empty at the end of a CIP sequence. On high level (for the selected CIP) the CIP tank makeup water inlet valve (00UN40S201) closes, while on very high level level an alarm shows up on the SCADA. The filling up of the CIP tank with water will be done together with the dry CIP chemicals by the aid of the educator.

Once the water has been filled in the tank, the liquid CIP chemicals are added to the solution in the tank while the mixer stirs the CIP solution. A sample may be taken after complete mixing of the chemicals & water, to adjust pH etc. at the CIP tank drain valve (00UN40S001).

### 1.4 Interpretation and terminology

The following abbreviations are used in this Works Information:

Abbreviation	Meaning given to the abbreviation
AIA	Authorised Inspection Authority
AFC	Approved for Construction
AKZ	Anlagen Kenn Zeichnungs
C&I	Control and Instrumentation
CIP	Cleaning in Place
CIDB	Construction Industry Development Board
COE	Centre of Excellence
CPS	Corrosion Product Sampler

CV	Curriculum Vitae
DCS	Distributed Control System
Demin	Demineralised
ECSA	Engineering Council of South Africa
EPRI	Electric Power Research Institute
HP	High Pressure
HT	High Temperature
LDE	Lead Discipline Engineer
LOSS	Limits of Supply and Services
LP	Low Pressure
LPS	Low Pressure Services
LT	Low Temperature
LV	Low Voltage
MCC	Motor Control Centre
NEC	New Engineering Contract
OBL	Outside Battery Limits
P&ID	Piping and Instrumentation Diagram
PEI	Production Engineering Integration
Pr. Eng.	Professional Engineer
Pr. Tech.	Professional Engineering Technologist
PS	Power Station
QAP	Quality Acceptance Procedure
QCP	Quality Control Procedure
RCA	Root Cause Analysis
ROC	Required Operational Capability
RP	Responsible Person
RT&D	Research Testing & Development
SCS	Stator Coolant System
SCWS	Stator Coolant Windings System
SHE	Safety, Health & Environmental
SRD	Stakeholders Requirements Definition
TSV	Thermal Shut-off Valve
UCLF	Unplanned Capability Loss Factor
USB	Universal Serial Bus

Vac	Alternating Voltage and current
VDSS	Vendor Document Submittal Schedule
W	Weekly
WTP	Water Treatment Plant

**2. Management and start up.**  
**2.1 Management meetings**

Regular meetings of a general nature may be convened and chaired by the *Project Manager* as follows:

Title and purpose	Approximate time & interval	Location	Attendance by:
Risk register and compensation events	As and when required	Project boardroom	<i>Employer, Contractor</i>
Toolbox talk/sessions	Every-day prior commence of work	Site	All the <i>Contractor's</i> employees.
Overall contract progress and feedback	Every week time to be agreed upon contract award	Projects Boardroom	<i>Employer's</i> and <i>Contractor's</i> Representatives
Kick off meeting	After contract award	Projects Boardroom	<i>Employer's</i> and <i>Contractor's</i> Representatives

Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the works. Records of these meetings shall be submitted to the Project Manager by the person convening the meeting within five days of the meeting.

All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the conditions of contract to carry out such actions or instructions.

**2.2 DOCUMENTATION CONTROL**

- (1) All documents supplied by the Contractor are subject to the Employer's acceptance. Documents such as detail design report, QCP's, method statements and other documents impacting the Works must be accepted by the Employer at least 14 working days prior to commencement of the Works.
- (2) Each revision of a document or drawing is accompanied with a list of the comments made by the Employer on the previous revision if applicable and the response/corrective

action taken by the Contractor. Changes will be recorded in a revision table contained on/in each drawing/document

(3) Documents and drawings indicate the Employer's reference number as allocated by the

Employer. The Contractor may have their own document or drawing number on the document or drawing the document or drawing, but where reference is made among documents or drawings, the Employer's number is used

4) The Contractor compiles a complete data book for all Works done containing the following as per VDSS:

a. Scope of work.

b. Detail design report.

c. Approved QC

d. Inspection reports and procedure

e. As built drawings.

f. Material summary that gives full traceability between components used, assembly drawings, material certificates and complete ordering information.

g. Maintenance, operating and troubleshooting documentation of all new plant equipment installed (as a minimum).

h. Updated wiring drawings of the panels (junction box and JD panels)

i. Cable test results.

j. As built Cable Schedules as per the Employer's 240-56176097: Electrical Cable Schedule Template.

k. Electrical load list as per the Employer's 240-56227927: Electrical Load List Template.

l. Updated switchgear schedules, cable schedules and cable block diagram (drawing 0.63/5057) where necessary.

m. Earthing test results and drawings indicating earth connection points for the new equipment.

n. All NCR's and corrective actions (Contractual Defect Notifications).

o. All NCR's and corrective actions (Contractual Defect Notifications).

### **2.2.1 Document Submission**

(1) All project documents must be submitted to the delegated Eskom Representative with transmittal note according to Project / Plant Specific Technical Documents and Records Management Work Instruction (240-76992014).

(2) In order to portray a consistent image, it is important that all documents used within the project follow the same standards of layout, style and formatting as described in the Work Instruction. (3) The Contractor is required to submit documents as electronic and hard copies and both copies

must be delivered to the Eskom Representative with a transmittal note.(4) In addition, the Contractor shall be provided with the following standards which must be adhered to:

- Documentation Management Review and Handover Procedure for Gx Coal Projects (24066920003)
- Project Documentation Deliverable Requirement Specification (240-65459834).
- Technical Documentation Classification and Designation Standard (240-54179170)

### **2.2.2 Engineering Change Management**

- All Design change management shall be performed in accordance to the latest revision of the Eskom Project Engineering Change Management Procedure (240-53114002) and the Employer shall ensure that Contractor is provided with latest revisions of this procedure.
- Any uncertainty regarding this procedure should be clarified with the Employer.
- All design reviews will be conducted according to the Design Review Procedure (240-53113685).

### **2.2.3 Drawings Format and Layout**

- (1) The creation, issuing and control of all Engineering Drawings will be in accordance to the latest revision of 240-86973501 Engineering drawing Standard. Drawings issued to Eskom will be a minimum of one hardcopy and an electronic copy.
- (2) All Contractors are required to submit electronic drawings in Micro Station (DGN) format, and scanned drawings in pdf format. No drawings in TIFF, AUTOCAD or any other electronic format will be accepted.
- (3) Drawings issued to Eskom may not be "Right Protected" or encrypted.

### **2.2.4 Plant Coding and Labelling**

- (1) Plant coding shall be done when applicable.
- (2) The Employer's AKZ Coding Manual shall be used to allocate codes to plant or system included in the Works. Plant Coding shall be undertaken by the Employer and as such the Contractor shall make available the following documentation to code:
  - The Employer will assign a coding technician who will interact with the Contractor in coding the plant as listed above. The Contractor will then be required to include allocated codes to all other designs and related documentation. It is also the responsibility of the Contractor to consistently apply the AKZ codes throughout the rest of the technical documentation on the VDSS.

- The Contractor shall ensure that all documentation is coded (as per the codes assigned by the technician) prior to submission to Employer for review.
- It is the responsibility of the Contractor to manufacture and install coded equipment labels. Labels are manufactured and installed according to Plant Labelling standard (240-71432150).

The Contractor will label all coded equipment. The Coding Technician shall facilitate baselining of all equipment lists, and only baseline equipment lists shall be used as a basis for the production of labels. The Coding technician will do a quality check on the adherence to the Coding and labelling standards before installation on plant.

#### **2.2. 5. Training Requirements**

- The Contractor will provide training on the new installations to the Employer's maintenance, operating and engineering staff. Training will take place before installation and commissioning of the eductor system. The training includes both theoretical and practical training: Training for operating staff will be focused on operating and troubleshooting of the associated mechanical equipment. Training for maintenance and engineering staff will be focused on operating, troubleshooting and maintenance of the associated equipment. Training for MMS and OPE personnel must focus on operating, mechanical troubleshooting and maintenance of the associated equipment. Training for EMS and EE personnel must focus on operating, electrical. Training for C&I maintenance and engineering personnel must focus on operating, C&I troubleshooting and maintenance of the associated equipment. Operating and maintenance trainees must receive certificates upon successful completion of the training. Training will be done on site, and the Contractor will provide the training material. The minimum number of people that will require training from each department are as follows:
  - a. Operating – 8
  - b. Maintenance – (2 Electrical, 2 C&I, 2 Mechanical)
  - c. Engineering – (2 Electrical, 2 C&I, 2 Mechanical)
  - d. Chemistry – 6 (3 Chemical, 3 Chemistry)

#### **2.2. 6. General Requirements**

- (1) The Contractor is to consult with the Employer on the scaffolding requirements for the project as scaffolding will be project by others.

- (2) Unless otherwise stated (for example, items that are to be relocated), the Contractor is responsible for the removal of all items and material that are redundant (items that are removed) as part of the Works. These are removed from the plant area and are laid down on site at a location to be indicated by the Employer.
- (3) Where this document is not clear about the location of an item to be installed or work to be done, it is the Contractor's responsibility to determine the correct location from the Employer's engineering representatives, and the Contractor will only act upon confirmation by receipt of an Engineering Instruction via the Employer's Project Manager. Incorrectly positioned items or incorrect work done (where Engineering Instructions were not issued) will be moved / removed / replaced / changed / reinstalled by the Contractor at his cost unless it can be explicitly proven that this document unambiguously shows an incorrect position/arrangement.
- 4) The Contractor will be responsible for all interfacing, functionality and compatibility of the C&I and electrical installations.
- 5) All flanged connections loosened as part of the Works is fitted with new gaskets (All gaskets to be supplied by the Contractor) Non-asbestos type gaskets to be used and MSDS for gaskets should also be provided. Bolts to be used must be torqued to 60% of the yield strength All bolts to be torqued (not flogged) in the "star" sequence in increments as sound engineering practice dictates. All bolts and nuts to be lubricated. After final tightening of the bolt at least two threads will protrude behind the nut. All flanges drilling to be according to EN 1092 PN 16 for 150NB and below and EN 1092
- (6) The Contractor provides the Employer with a method statement and project schedule together with the tender submission.
- (7) The Contractor to appoint its own AS to execute project scope.

## **2.2. 7. Material Requirements**

- (1) The Contractor is responsible for supply, delivery, installation and commissioning of all equipment specified in the scope, inclusive of connection brackets (if any), and all consumables required, C&I and electrical cabling, miniature circuit breakers, gaskets, pipe supports as well as bolts and nuts if required.
- (2) All material and equipment supplied by the Contractor is designed to operate in the required operating philosophy unless otherwise indicated in the Works.

### **2.3 PROCESS WORKS TO BE EXECUTED BY THE CONTRACTOR**

- (1) The Contractor is to design the system as per the design criteria listed below:
  - a. A system is required so as to minimize manual handling of the CIP chemicals during the offloading process

### **2.4 MECHANICAL WORKS TO BE EXECUTED BY THE CONTRACTOR**

### **2.4.1 General Mechanical Requirements**

The Mechanical requirement follows the process requirement and ensures that all components are within acceptable limits.

### **2.4.2 Mechanical Design**

The Contractor is required to carry out detail design and installation based on the Employer's Concept Design (below) for acceptance. The Contractor is to carry out this work in accordance to the requirements and standards indicated in the document and with the required legal and statutory requirements. The Contractor is permitted to use best practice engineering solution and make reasonable assumptions to complete the Works. The Contractor may supply alternatives from the Employer's Concept Design (below) provided the main option is also provided

(1) The detailed design report including the following:

- a. Detailed design report signed off by ECSA registered engineer
- b. Hydraulic Analysis of the system (preferred Flownex calculations)
- c. Operating and Control Philosophy
- d. Design drawings
- i. Piping & Instrumentation Drawings
- ii. Isometrics
- iii. General Arrangements

iv. As Built Drawings

2) The installation includes:

- a. Construction management
- b. Engineering
- c. Supply (All equipment for the design at worst case condition)
- d. Workshop fabrication and assembly
- e. Testing
- f. Signage
- g. All the consumables required for commissioning
- h. Cold Commissioning
- i. Hot Commissioning

#### **2.4.2.1 Employer's Design Concept**

(1) The Mechanical concept follows the process concept and ensures that all systems and subsystems are catered for.

- a. This includes but is not limited to
  - i. Tapoff RO- Permeate line to CIP tank
  - ii. Piping from Eductor System

iii. Piping to the CIP Tank

(2) The Contractor is responsible for all other systems that are required but are not listed above in order to achieve a fully functional Analysis System

**2.4.2.2 Pumping and Piping Design**

A pumping system is required to pump the RO permeate motive water to the educator. The CIP pump are envisaged to operate continuously by means of a bypass line to accommodate the batch CIP process. The pump is to operate on remote activation by means of an operator.

The existing pump that is to be utilised has the following flow and pressure characteristics:

**Table 1:RO permeate pump characteristics**

Flowrate	162m3/hr
Head	325 kPa
Duty	1
Standby	0

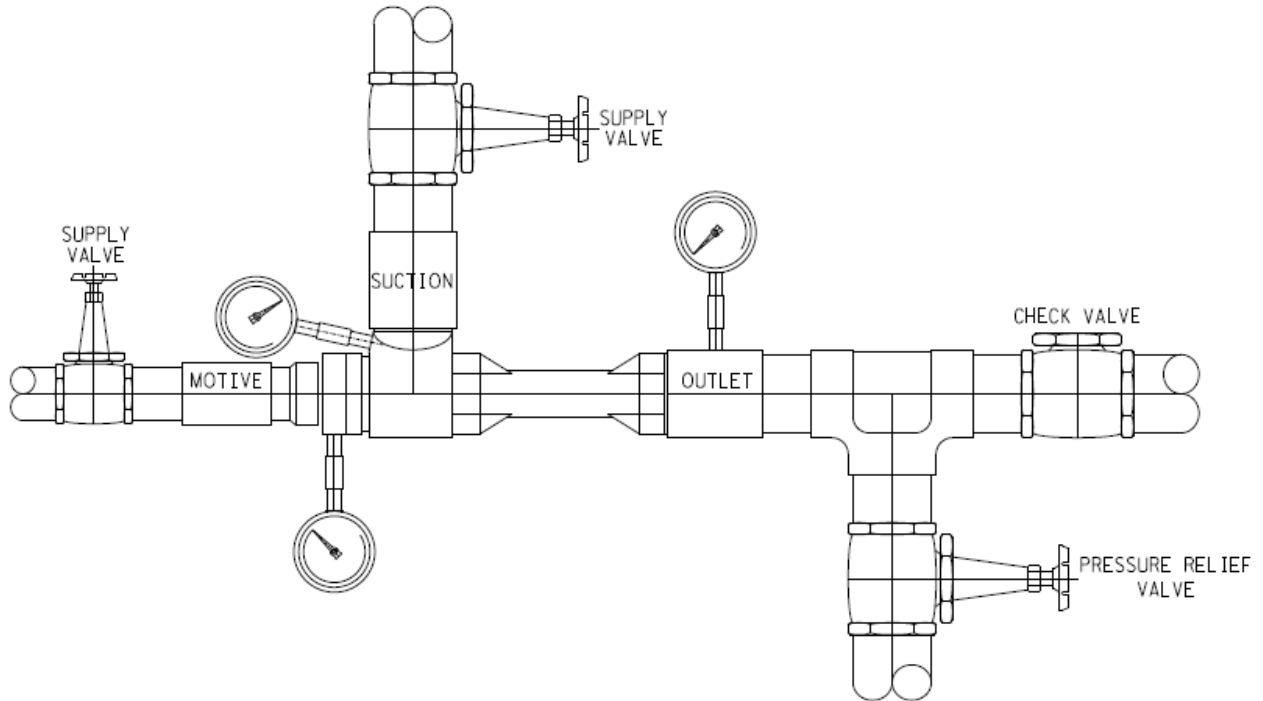
Envisaged Pipe size is a nominal size of 150mm. The route of the pipeline is to be determined by the contractor for optimal efficiency. Pressure drop that is permissible is a maximum of 50kPa/100m. The maximum permissible velocity is 2.5m/s. The pipeline is design generally in accordance with EN 13480. The size of the pipeline is to ensure the pipeline does not negatively affect the pump and the pump is to run as close to the best efficiency point as possible to ensure the flow. Ideally the pump is to run 5% forward and 10% back from its best efficiency point. The pump and piping system is to cater for an expansion of at least 20%. Temperature influence along the pipe is negligible; however, the site conditions are known to experience sub-zero temperatures.

Valves utilised are:

- Butterfly Valves for isolation
- Non – Return Valves for Pump Protection
- Air Release Valves
- Ball/Gate/Butterfly Valves for bypass

**2.4.2.3 Eductor Design**

The Eductor is required to be design in the configuration depicted below.



**Figure 2:Eductor Design**

The following table contains the design inputs to be used for the design of the educator.

**Table 2:Eductor design inputs**

Design Inputs	
Maximum Pressure Rating	PN 10
Maximum Design Pressure	500kPa
Maximum Motive Water Flowrate	162m <sup>3</sup> /hr
Maximum Suction Feed	25×25kg bags = 625 kg/hr
Solution Outlet Velocity	1.25 ×Settling velocity

**2.4.2.4 Dry Chemical Eductor Feeder Design**

The feeder is to be designed in accordance with the eductor and pump capabilities in mind and thus the maximum flowrate for the dry chemicals is to be 25×25kg bags =625 kg/hr

**2.4.2.5 Wet Chemical Design**

The feeder is to be designed with the eductor and pump capabilities in mind and thus the maximum feed flow rate for wet chemicals is 2x210L per hour.

**2.4.2.6 Bund requirements**

A Bund requirement is to cater for the containment of all chemical tank storage and associated water in the event of a spill. The bunded wall is to be adequately distanced from the tank (typically 1m away were possible) from any equipment and is required to have an slope and fitted with a scour valve. The bund design requirements are generally in accordance to SANS 10089 or SANS310. The bund should house tank contents, pump system and loading area. A drainage system will be included from the bund to be routed to the chemical containment area. The Contractor is to complete a risk assessment inline with chemical bund requirements inclusive of any possible incident that may result.

The Contractor is to ensure the chemicals (dry and wet) can enter the bunded CIP dosing system area with ease and minimal manual intervention from operators. The Contractor is to note that the bund will induce a tripping hazard and offloading difficulties and is therefore required to provide a risk assessment to mitigate any risks and present this to the project engineering manager for acceptance prior to execution.

### **2.4.3 Mechanical Technical Requirements**

#### **2.4.3.1 Pipework**

- (1) All the pipework supplied in one contract and complying with this specification is designed, manufactured, fabricated, erected and tested to comply with the contractually defined latest edition of a single national or international code and its associated standards. Mixing of codes from different countries of origin is not acceptable.
- (2) All pipes are to be sized to ensure that the process requirement is met with an economically viable and energy efficient solution. Pipe supports must be provide.
- (3) The pipeline conforms to environmental regulation. Pipes are to follow best practices and be generally in accordance to Code BS EN 13480.
- (4) The design should incorporate the provision for meaningful in-service non-destructive testing during periodic overhauls of the pipeline. The provision and installation of the primary measuring elements for the control and instrumentation will all be required. The provision of all isolating valves and the necessary actuators will be required.
- (5) All pipes are required to be suitable material with regards to the chemical compatibility, the Contractor determines the required pressure rating of the pipe based on the equipment and pumping system selected.
- (6) All pipes are required to be compatible for use with the temperature unit.
- (7) Pipes are required to be sloped and include drain valves to cater for drainage during maintenance and includes isolation valves.
- (8) The pipes are required to include all fittings (bends, expansion joints, etc.) and supports where needed.
- (9) Pipe supports are to be according to manufacturer specifications and design code EN 13480.

(10) Pipe sizes are to be selected so that the following maximum permitted velocities or pressure differentials are not exceeded by design, or maximum upset conditions.

**Table 3: Pipeline Design Conditions**

<b>System</b>	<b>Velocity Guideline (m/s)</b>	<b>Pressure Drop - Range kPa/100m</b>	<b>Pressure Rating</b>	<b>Material</b>
Motive Water pipework	0.5-2.5m/s	5 to 50	PN16	Compatible to RO Permeate
Solution Pipework	1.25 * Settling velocity	5 to 50	PN16	Compatible to Solution

(11) The Contractor submits the pipe data sheets and complete design to the Employer for acceptance.

(12) The Contractor's design verifies and ensures the integrity of all pipe work. The materials of construction for the pipework is suitable for the water and environment it is in contact with.

(13) The Contractor performs corrosion protection in accordance to 240-101712128: Standard for the Internal Corrosion Protection of Water Systems, Chemical Tanks and Vessels and Associated Piping with Linings.

(14) All pipes are painted at minimum in accordance to SANS 10140: Identification Colour Marking.

(15) Data books, to include all necessary material and test certificates maintained as part of the QA documentation and made available for inspection if so requested by the Employer.

(16) All welding is done in accordance to 240-106628253 Standard for Welding Requirements on Eskom Plant

#### **2.4.3.2. Valves**

(1) All valves are required to be manually operated.

(2) All valves are required to be new and compatible for use with the pipes that are used.

(3) The materials of construction of all valves are required to be compatible to content of the pipelines.

(4) Valve sizes in the following increments are preferred (excluding sample valves): 25NB, 50NB, 80NB, 100NB, 150NB, 200NB etc.

(5) Valve connections: 50NB and above: Wafer type butterfly valves; Below 50NB: BSP threaded connections.

#### **2.4.4 Mechanical Standards/Codes and Specifications**

- 240-123801640 Specification for Low Pressure Pipelines
- 240-56030558 Centrifugal Pumps Specification
- 240-105020315 Standard for Low Pressure Valves
- 240-56356376 On-Site Commissioning for Low Pressure Systems Standard

## **2.5 C&I WORKS TO BE EXECUTED BY THE CONTRACTOR**

The Contractor provides the whole of the C&I Works as defined in this document except where explicitly stated as otherwise.

### **2.5.1 General**

1. The Contractor will provide all equipment and services and execute all works to fulfil all requirements specified in this document.
2. The Contractor's Works complies with professional engineering practice and standards for fossil fuel power plants and is designed for the environmental conditions prevailing at the Power station site.
3. The Contractor will include the engineering, design, procurement, manufacturing, factory acceptance testing, delivery, off-loading at site, storage, installation, testing, commissioning, optimisation, and as-built documentation for provision of the C&I Works.
4. The Contractor provides the C&I works to meet the requirements that are defined in this document and also in the following documents:
  - a. Appendix A1 - Instrumentation Schedule.
  - b. Appendix A2 - Limits of Supply and Services (LOSS) Diagrams.
5. The Contractor provides the designs and documentation that are defined in this document and also in the following documents:
  - a. Appendix B - Vendor Document Submittal Schedule (VDSS).

### **2.5.2 Quality & Performance**

#### **2.5.2.1 Design Codes, Guidelines and Standards**

1. The Works will be provided in compliance with design codes, guidelines and standards referenced in this document.
2. The Contractor will obtain his own copies of International and National standards.
3. The Contractor will report any conflict within this document, with any referenced standards, specifications or technical guideline.
4. This document will take precedence over differences existing between this document and any document referenced within this document, except for statutory requirements.
5. Substitutions of any standard will be approved by the Project Manager. Additional standards proposed by the Contractor will be submitted to the Project Manager for approval.
6. Only the most recent versions of the relevant standards, guidelines, or codes will be used with this Works.

#### **2.5.2.2 Safety**

1. The earthing concept applied by the Contractor will be based on recognised best engineering practices and will ensure the safe and reliable operation of the C&I systems.

### **2.5.2.3 Reliability**

1. All C&I system equipment will be earthed to the station earth point.
2. The station earth point will be provided by the Employer.
3. All metal instrument casings will be properly earthed (grounded) to the earth mat to avoid any electromagnetic interference which may arise from portable RF transmitters, cell phones and other equipment used on the plant.
4. All earthing required to eliminate any interference will be provided.
5. All earthing will as a minimum be in accordance with the following standards and specifications
  - a. 240-56356396 - Earthing and Lightning Protection Standard.

### **2.5.2.4 Maintainability**

1. All field equipment will be available in South Africa as commercially-off-the-shelf (COTS) products.
2. All field equipment is supported by its OEM and maintainable by resources from South Africa until the end of the year 2041 for:
  - a. Technical services and support
  - b. Repair of faulty equipment
  - c. Supply of spare or replacement parts
3. All field equipment provided will be standardised to the maximum extent possible.
4. Instrumentation and supports are protected against corrosion and other harsh or hazardous environmental conditions that prevail at the Power station site.
5. Any special tools (i.e. not presently owned by the Employer) required for access to and maintenance of the field equipment is provided.

## **2.5.3 C & I Sytem**

### **2.5.3.1 Plant Operating and Control Philosophy**

1. The P&ID in Appendix C indicates that no additional final elements (i.e. valves/pumps/sensors) are required for control of the Eductor system. Hence the Eductor system will not be automated.
2. The CIP plant will be operated as per the existing operating procedures.
3. Local pressure gauges will be added for the local indication as shown in section 2.4.2.3
4. The Contractor will recommend any changes to the existing CIP plant operating and control philosophy based on the existing final elements as per the P&ID in Appendix C.
5. The existing philosophy is defined in section 1.3

### **2.5.3.2 Control System**

6. The Employer's control system for the CIP plant is the Siemens S7-300 Programmable Logic Controller (PLC).

7. The Employer implements the software for CIP control in accordance to the required operating and control philosophy in section.

### **2.5.3.3 Human Machine Interface (HMI)**

1. The Employer's HMI for the plant is the Wonderware InTouch SCADA system.

2. The Employer implements the functionality for the operators to start/stop the CIP plant from the control room.

### **2.5.3.4 Field Equipment**

#### **2.5.3.4.1 General**

1. All field equipment listed in the Instrumentation Schedule in Appendix A1 are interfaced to or provided by the Contractor according to Limits of Supply and Services diagrams provided in Appendix A2, respectively.

2. The Contractor provides field equipment in accordance with the Limits of Supply and Services diagrams provided in Appendix A2.

3. The LOSS diagrams are not to be considered as detail design documents; for their purpose is to demarcate the responsibilities for the various stages of the project from basic engineering up to and including commissioning; with the aim of indicating the physical interface point between the Contractor, Employer and Others.

4. Only the main field equipment is shown on the LOSS diagrams provided in Appendix A2 (e.g. instrument, etc.). Equipment or components not shown but required for the Works are provided as part of the Works (e.g. chemical seals, snubbers, fittings, etc.).

5. The physical interface points may include termination into cubicles, junction boxes, instrumentation, impulse piping and other interface points as defined in Appendix A2 required for completion of the Works.

6. The Contractor is responsible for managing, designing, clarifying, and finalising the physical interface points and physical interface requirements at the demarcation point when interfacing to equipment supplied by the Employer or Others.

7. All field equipment installations are provided in accordance with the requirements specified in the standard, 240-56355754 – Field Equipment Installation standard.

8. All field equipment operates over an ambient temperature range of: -10°C to 70°C.

9. All field equipment is installed in a suitable location ensuring that it operates in an environment within the parameters stipulated by the manufacturer.

10. Where harsh environmental conditions are not avoidable, field equipment designed for operation in that environment is used.

11. All field equipment are rated IP 67 or better, in accordance with IP rating requirements specified in IEC 60529 standard.
12. The equipment layout is such that when mechanical or civil work is performed, no field equipment is damaged.
13. All gauges and manifolds are mounted on suitable instrumentation stands.
14. All instrumentation stands provided are durable, sturdy and suitable for the environment in which they are installed.
15. Where angle iron is used for instrument stands, a minimum wall thickness of 3mm is provided.
16. Where instrumentation cannot be mounted on instrumentation stands the Contractor obtains clearance from the Project Manager for alternative installation.
17. The instrumentation stands are supplied complete with all holding down bolts and equipment to make a complete assembly.

#### **2.5.3.4.2 Pressure Measurement and Installations**

1. All pressure measurements and installations are provided in accordance with the requirements specified in the standard, 240-56355843 – pressure measurement systems installation standard.
2. Equipment/components required for the following process applications are parts of the Works and are specified in the standard, 240-56355843 – pressure measurement systems installation standard:
  - a. Sealing for viscous liquids or pressures of corrosive fluids or where plugging is possible.
  - b. Pressure systems or equipment subjected to vibration.

#### **2.5.3.4.3 Impulse Piping**

1. Impulse piping is provided for each measurement between the instrument and the existing impulse piping.
2. Impulse piping is provided in accordance with standard, 240-89147446 – Instrument Piping for coal Fired Power Plants Standard.
3. All pipe work provided is inclusive of supports, valves, fittings, transition pieces and drains to provide complete impulse, equalising and blow-down lines for all instruments.
4. All impulse pipe supports are such that galvanic corrosion is completely avoided. Clamp type supports are preferred.

#### **2.5.3.4.4 Welding**

1. All welding is provided in accordance with standard, 240-106628253 – Standard for Welding Requirements on Eskom Plant.
2. Non-destructive testing will be conducted on welds.
3. The result of all non-destructive testing on welds is accepted by the Employer.
4. Dye penetrant to detect surface defects such as cracks is performed on all welds.

5. In addition to the above-mentioned requirements, the Contractor provides specifications for the following, to be approved by the Project Manager:

- a. Weld Defect Classification and Reporting.
- b. Non-destructive testing.

#### **2.5.4 Configuration Management**

1. The Contractor codes and labels the instrumentation according to the latest revisions of:
  - a. 240-131050729 Hybrid Coding Standard
  - b. LIM103A Notes on Alpha-Numeric Plant Codification
  - c. 240-71432150 Plant Labelling Standard

#### **2.5.5 C&I Execution Strategy and Procedure for Submission and Acceptance of the Contractor's design**

##### **2.5.5.1 General**

1. During all project execution phases, the Contractor will:
  - a. Be responsible for carrying out all activities and supplying everything to provide the Works;
  - b. Conduct clarifications with the Employer, and Others;
  - c. Identify and resolve any discrepancies, ambiguities and errors encountered with the C&I input documentation;
  - d. Submit and update all engineering deliverables as defined in the VDSS in Appendix B.
2. All activities forming part of the project execution shall be reflected on, and scheduled according to the Approved Programme. As a minimum, the following phases of activities reflect in the Approved Programme:
  - a. Detailed Engineering.
  - b. Erection and Installation.
  - c. Commissioning.
  - d. As-built.

##### **2.5.5.2 Detailed Engineering Phase**

1. The objective of detailed engineering will be to translate the scope and requirements of the C&I Works into a fully functional C&I system.
2. A detailed implementation plan must be accepted by the Employer before the design freeze. The detailed engineering design freeze shall be indicated as a milestone in the Approved Programme.
3. The scope of detailed engineering will include, but not be limited, to the following:
  - a. Field engineering including mechanical hook-ups, GA drawings, etc.;
  - b. Design liaisons: during which the detailed engineering designs will be presented and clarified.
4. Detailed Engineering will include design clarification meetings with the Employer.
5. Erection and installation work will not continue until the detailed engineering phase is complete and accepted by the Employer.
6. The field work cannot commence without official access from the Employer.

7. During detailed engineering phase, the detailed engineering design freeze deliverables defined in the VDSS will be developed and clarified.

8. Detailed engineering will only be considered complete when the detailed engineering design freeze package defined in the VDSS has been submitted and approved.

### **2.5.5.3 Erection and Installation Phase**

1. The objectives of erection & installation phase will be to erect, install and perform on-site inspection and testing the C&I system.

2. During erection & installation deliverables defined in the VDSS will be updated and submitted.

3. Erection and Installation work will include the following:

a. Installation of instrument stands.

b. Installation of gauges.

c. Impulse piping (if applicable) up to the interface point.

4. Erection & installation will include hold and witness points, whose participants will include the Employer.

5. Erection & installation will include, but not be limited, to the following hold and witness points:

a. Quality and inspections and tests;

i. Quality inspections and tests will be carried after erection to verify the compliance of the installation with the approved design.

ii. The Employer's authorised representatives can inspect all parts during erection and may be present at any of the quality inspections and tests.

iii. All parts and equipment may be inspected at any stage during its erection. To this end, additional hold and witness points may be specified.

iv. All test equipment will be provided for any inspections and tests.

6. For on-site inspections, preliminary notification of readiness for hold and witness points will be given at least weeks in advance.

7. Erection and installation will only be considered complete when:

a. The quality inspections and tests for field equipment concerned have been approved by the Employer.

### **2.5.5.4 Commissioning Phase**

1. The objectives of commissioning phase will be to bring into service all equipment such that requirements and performance criteria of the specification are met.

2. Commission procedures will be provided by the Employer.

3. Commissioning will be performed in active cooperation with the Employer.

4. All test equipment and spares required for commissioning will be provided.

5. Commissioning will include, but not be limited, to the following hold and witness points:
  - a. Cold commissioning checks;
  - b. Hot commissioning checks;
6. Cold commissioning will include, but not be limited, to the following tests and inspection:
  - a. Documentation checks;
  - b. Visual inspections;
  - c. Function checks;
  - i. Measurement loop checks;
  - ii. Interlocks, feedbacks, commands and protections of drives;
- d. Calibration sheets will be provided for all instruments.
7. The objective of hot commissioning will be to test and verify the plant while systematically starting up the process such that at completion of hot commissioning, the plant is deemed available for safe plant operation.
  - a. In preparation for plant production, hot commissioning will include functional and safety testing while the process is active.
  - b. The individual control loops will be pre-tuned to allow for initial loading.
  - c. The C&I system equipment will be hot commissioned to demonstrate that the requirements of the specification are achieved.
8. Commissioning will be considered complete when:
  - a. The commissioning report has been approved by the Employer.

#### **2.5.5.5 As-built Phase**

1. The objectives of As-Built phase will be to verify the As-built documentation baseline of the C&I Works.
2. For the As-Built phase, the As-Built documentation package defined in the VDSS will be updated and submitted.
3. Approval of the 'As Built' documentation will be a pre-requisite for the completion of the C&I Works.

#### **2.5.6 Design and As-Built Documentation**

##### **2.5.6.1 General**

1. The Contractor provides the following documentation as defined in the VDSS in Appendix B:
  - a. Field equipment design functional specification.
  - b. Earthing & lightning protection design functional specification.
  - c. Mechanical hook-up drawings.
  - d. Instrument stand GA drawings.
  - e. Instrument stand location drawings.
  - f. Instrument schedule.
  - g. Instrument datasheets.

- h. Instrument O&M manuals.
- i. LOSS diagrams.
- j. P&IDs.
- k. Detailed engineering design freeze documentation.
- l. Erection and Installation documentation.
- m. Commissioning documentation.
- n. As-built documentation.
- o. Warrantee certificates.

#### **2.5.6.2 Field Equipment Functional Specification**

The field equipment functional specification describes the following points as a minimum:

- a. General description of equipment, materials and installation requirements or standards for all field equipment including:
  - i. Instrumentation.
  - ii. Instrument stands
  - iii. Instrument manifolds
  - iv. Instrument piping
  - v. Instrument piping supports
  - vi. Material specification
  - vii. Field equipment labels
- b. Instrument installation and measurement principle.
- c. Methodology for measuring long term drifts requirements.

#### **2.5.6.3 Earthing and Lightning Protection Functional Specification**

- 1. The earthing and screening functional specification details the following as a minimum:
  - a. Equipment connections to earth.
  - b. Earthing connection of cable racking to earth.
  - c. Measures that will be taken for lightning protection Field Equipment.

#### **2.5.6.4 Mechanical Hook-up Drawings**

- 1. It is a detailed mechanical hook-up drawing per instrument which shows all of the elements used to mechanically connect an instrument to the plant process.
- 2. All detailed mechanical hook-ups generated are based on the defined templates

#### **2.5.6.5 Instrument Stands GA Drawings**

- 1. Instrument stand GA drawings for each type of instrument stand available for use are to be provided showing dimensions, structural supports etc.

#### **2.5.6.6 Instrument Stand Location Details**

1. Location drawings are provided showing the location of all instrument stands on a plant arrangement drawing.
2. The location detail drawings are produced and grouped by applicable plant area.

### **2.5.7 Warranties**

1. All warranties for the equipment provided will be included as part of the Works.
2. All warranties will be in the name of the Power Station site.

## **2.6 ELECTRICAL WORKS TO BE EXECUTED BY THE CONTRACTOR**

The Contractor shall design/size, source/manufacture, test, supply, install, quality assure, commission and handover of all the electrical Works where/if required specified in the following subsections.

### **2.6.1 Description for electrical scope of work**

- The Contractor shall design, source/ manufacture, supply, install, test, commission and handover the power supply to the educator loads.
- The point of supply to be used is a 3 phase or 1 phase MCB feeder (depending on the load requirements) from 380 V Effluent Concentration Plant Board (51GD or 51GE). The Contractor shall ensure that protection is adequately rated and graded.
- The associated cabling inclusive of all necessary accessories and termination kits, related to the Works shall be provided.
- The cabling Works shall adhere to the Eskom Standard 240-56227443 - Requirements for Control and Power Cables for Power Stations Standard.
- The new equipment shall be electrically bonded to the existing station earth mat and associated tests conducted in accordance to 240-56356396 Earthing and Lightning Protection Standard.

### **2.6.2 Compliance to electrical standards**

- 240-56227443 - Requirements for Control and Power Cables for Power Stations Standard
- 240-56356396 - Earthing and Lightning Protection Standard

## **2.7 CIVIL WORKS TO BE EXECUTED BY THE CONTRACTOR**

### **2.7.1 Employer's Design**

The CIP tank is located within the water treatment plant of the power station. The tank is supported on four steel columns which are connected to four concrete stubs. The stubs are cast monolithically with the concrete ground floor slab/base (5 900 mm x 2 750 mm). The concrete slab/base also provides support for an installed pump and other pipe components. Figure 3 illustrates the associated civil infrastructures for the CIP tank and other equipment's



**Figure 3: Overall Layout of the Civil Infrastructure**

The *Employer* has conducted a concept design to determine the feasibility location and foundation requirements for the installation of the mechanical components associated with educator. The area located in front of the CIP tank was identified as an ideal location to install the educator as there is sufficient space to construct, operate and maintain the mechanical equipment. The available space identified is 3 000mm x 5 900 mm. Refer to 4, which illustrated the proposed location to install the pump and educator.



1. The final position of the concrete foundation/plinth is not to obstruct the maintenance of the existing equipment and access to a nearby staircase.
2. The Contractor is required to size and design a new concrete foundation/plinth for the installation of all mechanical components required for the project. The size of the foundation/plinth will be dependent on the dimensions and clearance distance required to operate and maintain the mechanical equipment/components.
3. The Contractor accounts for all loads that will be imposed onto the new concrete foundation/plinth.
4. The concrete plinth/foundation is to be bunded with masonry bricks, or similar approved, to contain the spillage of chemical during the operation of the mechanical equipment. The height of the bund wall will be designed to contain the volume of liquid spilled, which is estimated at 12m<sup>3</sup> and filled to approximately 75% capacity. The risk assessment and spillage to be verified at detailed design phase in line with the NEMA (National Environmental Management Act Guidelines).
5. The Contractor ensures that the height of the bund wall does not restrict the manual movement of chemicals (dry and wet) entering the CIP dosing system area.
6. The Contractor is to install a scouring valve within the bund wall to allow for the removal of any spilled chemical/liquid that would be contained within the bunded area.
7. The final elevation of the plinth/foundation is to allow for gravity flow of spilled liquids from the scouring valve to the drainage sump as illustrated in Figure 4.
8. The surface of the plinth/foundation is to be graded, by means of a concrete screed or similar approved, towards the scouring valve.
9. The Contractor is to include the drain pit within the sump. This is to include the existing drain point as well.
10. An epoxy coating, or similarly approved, is to be applied onto the interior surface of the bunded area (i.e. concrete and masonry surfaces). The aim is to prevent any chemical attack or deterioration on the civil infrastructure. The proposed material is to comply with the *Employer's* specifications (240-106365693: Standard for the External Corrosion Protection of Plant, Equipment and Associated Piping with Coatings).
11. The Contractor designs all layer works that are required for the new concrete foundation/plinth.
12. Backfill material must be homogeneous and must be compacted in 150mm layers to 93% Modified AASHTO density.
13. Density tests is to be carried out on all backfill materials used.
14. During the construction of the foundation/plinth, the existing concrete paving bricks are to be remove and stored. The location for storing the removed paving bricks will be as per the instruction of the Project Manager.
15. The gap between the new concrete foundation/plinth and the remaining paving bricks is to be sealed with a non-shrink grout. This will prevent the existing paving bricks from being dislodged.

16. All proposed materials, including datasheets, are to be submitted to the Project Manager for review and approval prior to being used.

### **2.7.3 Construction**

#### **2.7.3.1 General**

The Contractor:

1. Adhere to the South African Environment Protection Act, the waste management code of practice and the South African Occupational Health and Safety Act No. 85 of 1993, the regulations promulgated thereunder and Eskom Safety, Health, Environment and Quality (SHEQ) Policy 32-727 and Waste Management Procedure, as well as the National Building Regulations and SANS 10400 for all works.
2. Submits a comprehensive construction method statement (including a comprehensive risk assessment) detailing the proposed methods for the entire works to the Project Manager for acceptance prior to the start of the works.
3. Submits a project specific safety file to the Project Manager for comments / acceptance.
4. Submits a detailed level 3 schedule for the works to the Project Manager for acceptance after contract award.
5. Takes all necessary precautions to ensure that none of the existing structures / facilities not forming part of the works is damaged during the assessment/inspection. The Contractor is liable for all damages that may occur and repairs are to be done at no additional cost to the Employer.
6. The Contractor disposes of all waste material at a waste disposal site ( as confirmed by the Project Manager) to be approved by the Project Manager. The waste disposal site is selected to suit the classification of the materials to be disposed of. Certificates of disposal are required to be submitted to the Project Manager.
7. Continuously monitors the conditions within the working and surrounding areas for any hazardous substances or situations, and in such case, the Contractor is required to take necessary precautionary measures.
8. The Contractor ensures that a complete QCP, risk assessment, method statement and ITP's, where applicable are submitted to the Project Manager for review and acceptance before the works can commence. During reviews of the ITP's, the Employer provides the necessary intervention points.
9. All items that are assembled and constructed off site are listed and provided to the Project Manager. From this, an ITP is developed between the Project Manager and the Contractor to determine the intervention points.
10. Manages access to the working areas and the Site.

11. Manages activities on Site to ensure that no interference takes place between the works and that of others.

12. Liaise with the Project Manager regarding utilities and telephone facilities required for his site establishment.

13. Liaises with the Project Manager regarding the location of waste disposal sites and rubbish dumps.

14. The Contractor is responsible for the design and erection of all the temporary supports required for the works. In addition to the aforementioned, the Contractor adheres to the following:

- The Contractor is restricted to the designated working areas
- The Contractor is not to enter any other areas and ensures that his employees abide by the applicable regulations
- The Contractor performs all hoisting and lifting by qualified riggers
- The Contractor's Equipment does not impair the operation or access to the plant/building
- The Contractor provides any temporary or expendable materials required for the storage of materials
- The Contractor safeguards and secures all items whilst in the Contractor's custody and control, until completion of the works;
- Plant and equipment not forming part of the works are not to be modified without written permission from the Project Manager. Modification in this sense includes, but is not limited to the following:
  - Welding onto existing plant,
  - Drilling into structural steel or concrete,
  - Cutting or removing
  - Loading adjacent structures.

### **2.7.3.2 Construction and Monitoring**

1. The Contractor is responsible for the construction of all works in accordance with the accepted designs, drawings and specifications.

2. The Contractor is responsible for the safety of all personnel involved in the works as well as the safety of all personnel at Lethabo Power Station affected by the construction of the works.

3. The Contractor notifies the Project Manager of any defects that have occurred or are foreseen in order to reduce further damages that may occur.

4. The Contractor is responsible for the design, erection, maintenance and removal of all temporary works required for the execution of the works.

5. The Contractor provides the required level of construction monitoring to ensure that the construction is completed in accordance with the approved designs, drawings and specifications.

- Technical quality assurance during construction to ensure that the construction is executed as per the approved design, specifications and procedures
- Witnessing and approval (by signature) of intervention points where applicable to Engineering
- Review and acceptance by signature of construction data books, as-built drawings and Operations and Maintenance manuals (where applicable) developed by the Contractor
- Review and acceptance by signature of Contractor's Welding Procedure Specifications, Welder Qualification papers, NDT testing reports, Visual Inspection reports, Fall Protection Plans, Working at Heights Plans
- Responding to technical queries and clarifications from the Contractor utilising documentation templates provided by the Employer

6. The Contractor takes full professional accountability and liability for all temporary items required for the execution of the works.

### **2.7.3.3 Construction Programme**

1. As part of the Method Statement and as a tender returnable, the Contractor submits a Level 3 construction programme considering all the interfaces and time constraints.
2. This programme does not omit key activities. Timing of the activities is consistent with the Construction Work Method Statement.
3. The programme is to show that the Contractor has a clear understanding of the full scope of works, including the accompanying risks. The programme is to be logical and realistic.
4. The Contractor submits a Programme for all the phases of the works to the Project Manager for his acceptance.
5. This programme is accompanied with the following:
  - A comprehensive narrative which describes the basis of the programme;
  - A list of assumptions that the programme was based on;
6. The programme clearly indicates the following:
  - Activities of all the project work to be done by the Contractor and the other work covered by the contract that is being done by the sub-contractors;
  - Logical links/ sequence/ relationships that connect the various activities together (showing all hold points);
  - Master schedule is to show Links/logic, the CPM (Critical Path Method) technique is used for programme and planning. The critical path is clearly illustrated.
  - The works is completed within accepted durations that are in consistence with key dates provided in the Contract Data. Milestone dates in line with Key Date/Contract Data shown on the schedule.

- Schedule Work Package Classifications (Deliverable, Engineering, Procurement, Manufacturing, Supply, Construction and Installation Work Packages)
- The amount of shifts planned per day for each section of the works.
- The way in which the Contractor plans to interface with Others. Interface points with Others are identified in the programme;
- A comprehensive description of each activity, including the name and designation of the responsible person;
- Full details of all terminal point release requirements;
- Any erection or commissioning activities that may affect other maintenance and construction activities on Site;
- Identifies when services are required for commissioning purposes;
- Sufficient information with regard to the activity duration and a description to enable measurement of the progress of the activity within the required update period;
- Each description in the programme explains and represents the performance of the activity, including tangible deliverables or products;
- Resources required to perform an activity for each activity that requires resource assignment;
- Single source of responsibility or ownership per activity.

#### **2.7.4 Documentation and Configuration Management**

##### **a. Document identification**

All documents supplied by the Contractor are subject to the Employer's approval. The language of all documentation is required to be in English.

##### **b. Document Submission**

- All project documents must be submitted to the delegated Employer's Representative with transmittal note according to Project / Plant Specific Technical Documents and Records Management Work Instruction (240-76992014). In order to portray a consistent image it is important that all documents used within the project follow the same standards of layout, style and formatting as described in the Work Instruction.
- The Contractor is required to submit documents as electronic and hard copies and both copies must be delivered to the Employer's Representative with a transmittal note.

In addition, the Contractor adheres to the following standards:

- Documentation Management Review and Handover Procedure for Gx Coal Projects (240-66920003).
- Project / Plant Specific Technical Documents and Records Management Work Instruction (240-76992014)

##### **c. Email Subject**

The Contractor submits all documentation to the Employer's Representative in the following media:

- Electronic copies are submitted to Eskom Documentation Centre through generic email address (drmservices@eskom.co.za). The email subject as a minimum has the following: (Station\_Project Name\_Discipline\_Subject). Electronic copies that are too large for email are delivered on CD/DVD, large file transfer protocol and/or hard drives to the Project Documentation Centre. In a case where CD has been submitted, a notification email, with the transmittal note attached, is sent to the project generic email address. The Representative is copied on the email as well.
- Hard copies are submitted to the Employer's Representative accompanied by the Transmittal Note.

### **2.7.5 Drawings Format and Layout**

1. The Contractor ensures that creating, issuing and control of drawings are in accordance with the Employer's Engineering Drawing Standard (240-86973501).
2. The Contractor submits editable electronic drawings in DGN format and in PDF format. Drawings issued to the Employer are not "Right Protected" or encrypted. Drawings issued will be a minimum of one hardcopy and an electronic copy in both pdf and DGN. format.
3. Electronic drawings have a watermark indicating the approval phase of a drawing and hardcopies are to be stamped to indicate the approval phase i.e. preliminary, issued for review, issued for construction, etc.
4. The Contractor's drawings are complete in every respect (including welding details which are fully described) and are checked by the Contractor prior to submission to the Project Manager for acceptance. All drawings show full endorsement by a professionally registered engineer/technologist with ECSA (including the ECSA registration number and signature on all drawings).
5. Any drawing prepared or made for the purpose of carrying out the works is the property of the Employer and may be used by the Employer as the Employer deems fit.
6. Each drawing set have an overview drawing which shows the overall layout of the system relevant to the drawing, with references to drawings where the details of the components depicted in the overview drawing can be found.
7. A design drawing package is issued with one drawing number and multiple sheets, instead of multiple drawing numbers. The breakdown of the drawing packaging is sent to the Project Manager for acceptance.
8. Drawings containing references to interfacing systems and to other applicable/relevant drawings includes the Employer's drawing number as well.
9. All dimensions are provided. No dimensions are obtained from a drawing by scaling.
10. Tolerances for the design are clearly indicated on the drawings.
11. The final detailed engineering drawings that are issued for construction are on revision 0. Drawings submitted prior to that, have revisions of 0.1, 0.2 or a, b, c etc.

12. All cells in the drawing title block needs to be populated and completed before the drawing is signed off.

### **2.7.6 Contractor's responsibilities during the Employer's Design Review Process**

1. The Project Manager conducts Design Reviews as per the Employer's design review procedure; Participation of the Contractor in the Employer's Design Reviews consists of:

- The Project Manager conducts design reviews as per the Employer's design review procedure and the Contractor presents (the design developed by him) and participates in the design review.
- If any fundamental errors are found in the designs or further actions are required, the Contractor addresses all concerns raised and revises the designs.
- The Contractor submits the documents for another design review once all designs are revised according to the concerns raised by the Project Manager.
- If no fundamental errors are found in the designs during the design review session, the Project Manager compiles the design review minutes and report.
- The Contractor reviews the report and minutes. If the report/minutes are not acceptable, the Contractor submits comments to the Project Manager.
- The Project Manager accepts the Contractor's design once the design review report is accepted and signed by the Employer's project team.

### **2.7.7 Time required for acceptance of designs**

1. Not later than 21 days after receipt, the Project Manager returns a comment log to the Contractor that contains the review comments for the Contractor's design.

### **2.7.8 Engineering Change Procedure**

1. The Contractor takes note of the Employer's Engineering Change Procedure (240- 53114026) An engineering change includes any proposed engineering change originating from the Contractor or Employer from an established design baseline in the design review procedure

### **2.7.9 Professional Engineering Certification**

The Contractor's professional civil engineer/technologist who is registered with the Engineering Council of South Africa provides design certification in accordance with SANS 10400-A, declaring the design "fit for purpose" in terms of the relevant design codes and the OHS Act. The Contractor will be required to provide a 2-part certification, one after completion of the design and a separate certification upon completion of the construction in accordance with SANS 10400\_A declaring that the construction was carried out in accordance with the approved design and the OHS Act.

### **2.7.10 Quality and project handover requirements**

#### **2.7.10.1 Quality Management**

1. The Contractor submits a fully detailed Quality Control Plan (QCP) for acceptance, which details all the aspects of the quality management system to be applied. It includes the methods that will be utilized to ensure quality assurance, control and improvement of the identified activities as stated in the Scope of Works.
2. The Contractor submits a schedule of unpriced orders to be placed and this is updated regularly.
3. The Contractor is responsible for defining the level of QA/QC (Intervention Points) or inspection to be imposed on his sub-Contractors and suppliers of material in the Quality Control Plans (QCPs). This level is based on the criticality of equipment and must be submitted to the Project Manager for acceptance.
4. Product data sheets, product samples, and any other documents are submitted for review and acceptance by the Project Manager after contract award and prior to the commencement of work.
5. All quality control documentation is submitted to the Project Manager within seven (7) days of Contract date

#### **2.7.11 Handover**

1. Apart from any statutory data packages required, the Contractor also submits a data package of the relevant drawings, test certificates etc. to the Project Manager for acceptance. These include, but are not limited to:

- Approved ITP's, QCP's
- Concrete 7 day and 28 day cube test results
- Slump test results
- Concrete mix designs including all required test results e.g. aggregate test results
- Pre-concrete and post concrete surveys
- Method statements and specifications adhered to
- Risk assessments
- Approved drawings
- Inspection reports
- Notifications
- Modifications
- Technical Queries, Engineering Responses and communications with Project Manager/Employer
- Non-conformance reports
- Transport notifications
- Calculations for any temporary works that may be required for the safe execution of the works
- Material certificates
- Test results and reports

- As-built data and drawings of the completed works upon handover. As-built drawings are submitted in PDF and native CAD formats.

## 2.7.12 Specifications for Civil the Works

### 2.7.12.1 Applicable Standards

The Contractor is required to adhere to the latest editions of and the normative references within the following SANS standards and other codes of practice, regulations & standards:

Number	Title
240-56364545	Structural Design and Engineering Standard
240-86973501	Engineering drawing Standard
SANS 10400	The Application of the National Building Regulations
240-107981296	Constructability Assessment Guideline
240-99527377	Inspection Manual for Civil Works at Eskom's Power Station
SABS 471/ SANS 50413 & SANS 50196	Portland cement (ordinary, rapid hardening and sulphate resisting)
SANS 2001-BE1	Construction works Part BE1: Earthworks (general)
SANS 2001-BS1	Construction works Part BS1: Site clearance
SANS 2001-CC1	Construction works Part CC1: Concrete works (structural)
SANS 5861-2	Concrete tests - Sampling of freshly mixed concrete
SANS 5862-1	Concrete tests - Consistence of freshly mixed concrete - Slump test
SANS 5863	Concrete tests - Compressive strength of hardened concrete
SANS 5864	Concrete tests - Compressive strength of hardened concrete
SANS 10400	The Application of the National Building Regulations
SANS 1200 G	Standardized specification for civil engineering construction Section G: Concrete structural

### 2.7.13 Additional Requirements and Pre-requisites

1. The Employer will arrange a mandatory site clarification meeting with all tenderers so that tenderers are afforded the opportunity to visually inspect the works to be done.

#### 2.7.13.1 Reinforced Concrete

1. All concrete work is required to be in accordance with SANS 2001-CC1 and SANS 10100-2 unless otherwise stated.
2. All concrete surfaces and cast-in items is required to be inspected and accepted by the Employer in writing before casting of concrete may commence.
3. The Contractor is required to obtain written acceptance from the Employer for the use of any admixture or the use off ready mixed concrete, to pump concrete, or to use cement or cement blends other than ordinary Portland cement.
4. Compaction of concrete is required to be done by means of mechanical vibrators only.
5. The Contractor is required to submit the concrete mix design to the Employer for acceptance.

6. The Contractor is required to demonstrate, by means of a report from an approved laboratory, that the aggregates do not exhibit excessive shrinking properties in accordance with SANS 1083 and is also required to demonstrate that the aggregates do not have a potential alkali silica reaction.

7. All concrete is required to have a maximum water/cement ratio of 0.45 with a minimum cement content of 420 kg/m<sup>3</sup>

8. The Contractor is required to perform a slump test on the same batch of concrete every time a sample is taken and the result recorded.

The table below indicates particular specifications pertaining to SANS 2001-CC1 and must be read in conjunction with the code.

**Table 4:SANS**

<b>Clause</b>	<b>Particular Specification</b>
<b>4.2</b>	<b>Materials</b>
4.2.3.5	The following tests are required: <input type="checkbox"/> drying shrinkage on fine and course aggregates; <input type="checkbox"/> drying shrinkage of concrete; <input type="checkbox"/> flakiness index of the stone; <input type="checkbox"/> alkali-silica reaction; <input type="checkbox"/> alkali-aggregate reaction.
4.2.7	In general, one of the following types of non-shrink grout are required to be used: <input type="checkbox"/> Cement-based non-shrink grout, not less than 50 MPa; <input type="checkbox"/> Special proprietary non-shrink or expansive grout, not less than 50 MPa.
4.2.6	Concrete Grade is required to be: <input type="checkbox"/> Class 15 MPa/ 19 mm for Blinding Concrete (28

<b>Clause</b>	<b>Particular Specification</b>
	<ul style="list-style-type: none"><li>• Class 35 MPa/ 19 mm for Structural Concrete (28 days).</li></ul>

<b>4.3</b>	<b>Formwork</b>
4.3.1.8	<input type="checkbox"/> Tolerances on all concrete work is required to be a level II degree of accuracy as specified in SANS 2001-CC1 with and is to be carefully maintained throughout the construction.

<b>4.4</b>	<b>Reinforcement</b>
4.4	Add the following:

- 4.4.3.1 All reinforcement is stamped with a SANS quality assurance mark.  
Cast in-situ concrete cover is required to be a minimum of:
- 60 mm for exposed to earth or water;
  - 40 mm for above ground or not in contact with soil.

## 4.7

### 4.7.1.1

#### Quality of Concrete

- Contractor* submits to the *Supervisor* full details and samples of all materials which he proposes to use for making concrete at least 28 days before the concreting of the works is due to commence.

### 4.7.10

Add the following:

- A layer of blinding concrete of 50 mm minimum thickness is required to be placed under foundations.
- A polyethylene sheet with a minimum thickness of 250 microns is required under ground slabs

### 4.7.12.2.3

- All angled corners are chamfered 20 mm x 20 mm, unless such other larger size is detailed on the Drawings.

### 4.7.19.3

- Contractor* submits a detailed procedure for acceptance by the *Supervisor* on how he intends to carry out the repairs of structural concrete defects

### 4.7.22

- For concrete pour records, the *Contractor* submits a detailed Quality Control Plan to the *Supervisor* for acceptance.
- In addition the *Contractor* supplies the *Supervisor* with two copies of these records each day covering works carried out the preceding day.

## 5.1

### 5.1.1.4

#### Testing

- Six 150 mm cube samples taken from each batch or place of concrete deposition, three cubes are tested at 7 days and three at 28 days.

## Particular Specification

- Strength at 7 days is required to be at least two thirds of 28 day strength.

### 5.1.2.1

Any of the cube samples tested indicating a result more than 3 MPa below the specified strength is disregarded.

### 5.1.3.3

Add the following:

..., unless no more than three batches of concrete is being mixed.

## 5.2

### 5.2.1.1

#### Tolerances

Tolerances on all concrete work is required to be a level II degree of accuracy as specified in SANS 2001-CC1 with and is to be carefully maintained throughout the construction.

### 5.2.2.1 Table 11

Add the following under "Location of holding-down bolts":

3) The permissible deviation between any two bolts that share the same base-plate is limited to 2mm for bolt sizes up to and including M24, and 3mm for bolts larger than M24.

## 2.7.14 DELIVERABLES

The Contractor provides the following document deliverables as part of the works.

### 2.7.15 Tender Phase

The tenderer submits the following as a minimum in the tender submission:

1. A Level 3 schedule for the assigned scope clearly highlighting all activities involved, major milestones and provision for the Employer review.
2. Method Statement for the entire works clearly demonstrating understanding of and compliance with the full scope as detailed in the scope of works.
3. Relevant experience in the design and construct of similar projects. List of verifiable relevant references (minimum of 3 projects) must be provided for the works completed within the last 5 years. References to include contact numbers and name of client, description of scope in the project and the cost of the project as a minimum.
4. CV's of the proposed key resources each having a minimum of 5 years' relevant experience (construction manager, design engineer). Civil engineer/technician to be professional registered with

the Engineer Council of South Africa. Copy of valid certificate to be provided. Organogram of site team to also be provided clearly indicating the roles that the resources will fulfil in the project.

#### **2.7.16 Planning Phase**

1. A Level 3 schedule (schedule with defined activities) for the scope clearly highlighting all activities involved, major milestones and provision for the Employer to review.
2. Method Statement
3. Risk Assessments
4. Project specific safety file
5. Project Quality Control Plan
6. VDSS
  - The Contractor is required to update the provided VDSS throughout the project phases.

#### **2.7.17 Design Phase**

1. Consolidated detail design report signed by a professionally registered Civil Engineer/Technologist which includes:
  - Survey drawings, design criteria/parameters, specifications and standards used, loadings, assumption, calculations results including detailed design calculation, design models, source of information and any record of other information associated with the completed works.
2. Detailed drawings for construction, signed by a professionally registered Civil Engineer/Technologist. Drawings are to be submitted in DGN. formats.
3. Construction specifications for the works including measurement and payment items.
4. Priced Bill of Quantities for the works.
5. Detailed Risk Assessments

#### **2.7.18 Pre-construction Phase**

1. Detailed method statements for the construction of the works (including Rigging Studies)
2. Inspection and Test Plans (ITP's) indicating all intervention points
3. Quality Control Plans (QCP's)
4. Construction Programme
5. Project Specific Safety File (updated)
6. Any temporary works required as part of construction signed by a professionally registered Civil Engineer/Technician
7. Detailed Risk Assessments (updated)

#### **2.7.19 Post-construction Phase**

1. QA returnable (monthly)
2. As-Built drawings
3. Data books as detailed in Section 3.15.11

4. Certificate of completion, signed by the ECSA registered civil engineer/technologist, confirming that the works has been constructed in accordance with the design.

## **2.8 WORKS TO BE EXECUTED BY THE EMPLOYER**

1) The Employer's engineering representatives will review the detail design package, will assist with quality assurance during project execution, review QCPs, assess validity of equipment specifications against design before installation and assist with commissioning of plant.

(2) The Employer's operating representative will assist with testing and commissioning of the new analysers.

(3) The Employer assigns personnel from operating, maintenance and engineering for operating, troubleshooting and maintenance training on the new equipment.

## PART 4: SITE INFORMATION

Core clause 11.2(16) states

“Site Information is information which

describes the Site and its surroundings and is in the documents which the Contract Data states it is in.”

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information

### **C4.1: Information about the *site* at time of tender which may affect the work in this contract:**

#### **1. Site Procedures and Regulations**

##### **1.1 Health and Safety Requirements**

The *Contractor* and his sub-*Contractors* ensure at all times compliance with safety regulations imposed by any Act of Parliament, ordinance or any regulation or by-law of any local or statutory authority.

- The *Contractor* acts in accordance with the health and safety requirements stated in the Works Information.
- In carrying out its obligations to the *Employer* in terms of this contract; in Providing the Works; in using Plant, Materials and Equipment; and while at the Site for any reason, the *Contractor* complies and procures and ensures the compliance by its employees, agents, Sub-*Contractors*, and mandataries with:
- the provisions of the Occupational Health and Safety Act 85 of 1993 (as amended) and all regulations in force from time to time in terms of that Act (“the OHS Act”); and the Eskom “Health, Safety and Environmental specifications for *Contractors*” document attached to the Works Information (as amended from time to time) and such other Eskom Safety Regulations as are applicable to the *works* and are provided in writing to the *Contractor* (collectively “the Eskom Regulations”). The Eskom Regulations may be amended from time to time by the *Employer* and all amendments will be provided in writing to the *Contractor*. The *Contractor* complies with the provisions of the latest written version of the Eskom Regulations with which it has been provided; and the health and safety plan prepared by the *Contractor* in accordance with the SHEQ Requirements (The OHS Act and the Eskom Regulations are collectively referred to as the “SHEQ Requirements”).
- The *Contractor*, at all times, considers itself to be the “*Employer*” for the purposes of the OHS Act and shall not consider itself under the supervision or management of the *Employer* with regard to compliance with the SHEQ Requirements, the *Contractor* shall furthermore not consider itself to be a subordinate or under the supervision of the *Employer* in respect of these matters. The *Contractor* is at all times responsible for the supervision of its employees, agents, Sub-*Contractors*, and mandataries and takes full responsibility and accountability for ensuring they are competent, aware of the SHEQ Requirements and execute the *works* in accordance with the SHEQ Requirements
- The *Contractor* acknowledges that it is fully aware of the requirements of all the above and undertakes to employ only people who have been duly authorized in terms thereof and who have received sufficient training to ensure that they can comply therewith.
- The *Contractor* ensures that all statutory appointments and appointments required by any Eskom Regulations are made and that all appointees fully understand their responsibilities and are trained and competent to execute their duties. The *Contractor* supervises the execution of their duties by all such appointees.
- The *Contractor* shall appoint a person who will liaise with the Eskom Safety Officer responsible for the premises relevant to this contract. The person so appointed shall, on request: supply the Eskom Safety Officer with copies of minutes of all Health and Safety Committee meetings, whenever he is required to do so; supply the Eskom Safety Officer with copies of all appointments in respect of employees employed on this contract, in terms of the Act and Regulations and shall advise the Eskom Safety Officer of any changes thereto.

The *Employer*, or any person appointed by the *Employer*, may, at any stage during the duration of this contract:

- conduct health and safety audits regarding all aspects of compliance with the SHEQ Requirements, at any off-site place of work, or the site establishment of the *Contractor*. refuse any employee, Sub *Contractor*, or agent of the *Contractor* access to the premises if such person has been found to commit an unsafe act or any unsafe working practice or is found not to be qualified or authorised in terms of the SHEQ Requirements.
  - issue the *Contractor* with a stop order should the *Employer* become aware of any unsafe working procedure or condition or any non-compliance with any provision of the SHEQ Requirements.
  - The *Contractor* immediately reports any disabling injury as well as any threat to health or safety of which it becomes aware at the *works* or on the Site to the *Project Manager*.
- The *Contractor* undertakes not to do, or not to allow anything to be done which will contravene any of the provisions of the Act, Regulations or Safety and Operating Procedures.
  - The *Contractor* appoints a person, qualified in accordance with the SHEQ Requirements, as the liaison with the Eskom Safety Officer for all matters related to health and safety, this person shall be reachable 24 hours a day.
  - The *Contractor* confirms that it has been provided with sufficient written information regarding the health and safety arrangements and procedures applicable to the *works* to ensure compliance by it and all employees, agents, Sub-*Contractors*, or mandataries with the SHEQ Requirements while Providing the Works in terms of this contract. As such, the *Contractor* confirms that this contract and the relevant Eskom Regulations referred to in this contract constitute written arrangements and procedures between the *Contractor* and the *Employer* regarding health and safety for the purposes of section 37(2) of the OHSA.
  - The *Contractor* agrees that the *Employer* is relieved of any and all of its responsibilities and liabilities in terms of Section 37(1) of OHSA in respect of any acts or omissions of the *Contractor*, and the *Contractor's* employees, agents, or Sub-*Contractors*, to the extent permitted by the OHSA.
  - The *Contractor* hereby indemnifies the *Employer* and holds the *Employer* harmless in respect of any and all loss, costs, claims, demands, liabilities, damage, penalties or expense that may be made against the *Employer* and/or suffered or incurred by the *Employer* (as the case may be) as a result of, any failure of the *Contractor*, its employees, agents, Sub-*Contractors* and/or mandataries to comply with their obligations in terms of clause 16, and/or the failure of the *Employer* to procure the compliance by the *Contractor*, its employees, agents, Sub *Contractors* and/or mandataries with their responsibilities and/or obligations in terms of or arising from the OHSA.
- In carrying out his obligation as the mandatory to the *Employer* for this contract in terms of the National Environmental Management Act No.107 of 1998, the *Contractor* ensures that he complies with the Act when Providing the Services or using plant, materials, or equipment.

## 1.2 Permit to Work System

- NO work shall be carried out without a "PERMIT TO WORK"
- The *Contractor's* Responsible Person(s) must satisfy himself that all sources of possible danger are isolated. Details of the Permit to Work system can be found in the Plant Safety Regulations for Lethabo Power Station, Eskom OPR 3305. The *Contractor* must also make provision for his Authorise Supervisor(s) that is trained according to the procedure mentioned above.
- A Master Permit to Work is used on declared major outages, details can be found in local procedure LBA 00085. Permit changes are made during the dead time, if it is required by the *Contractor* that a certain supply be made available, or plant tested than this can be applied for at the Outage Management Meeting at least 1 day in advance.
- Plant with a prohibitive sign attached may only be operated by appointed Eskom personnel. Any *Contractor* employee found tampering with such plant will be permanently removed from Site.

## 1.3 Safety Induction Course

- All the employees of the *Contractor* must attend a safety induction course before they will be allowed to work on the Site. It is the responsibility of the *Contractor* to ensure that all employees have attended the safety induction.

- A list of employees requiring safety induction must be submitted at least 2 days in advance of arrival on site with the date and time of arrival so that the safety induction can be arranged.

#### 1.4 IBI Awareness Techniques

- "To prevent incidents and ensure continuous improvement of Lethabo Power Stations business performance in all areas affecting safety, reliability and production, it is expected of all **CONTRACTORS** service personnel, to attend a three(3) hour training session on Integrated Business Improvement Awareness, which has to be done as soon as work has commenced; This is to ensure familiarisation and use of error-prevention tools/techniques inclusive of, Pre and Post-job briefs, Risk Assessments, Self-checks(STAR principle), Job observations, Effective communications e.g.3-way, Questioning attitude, Procedural adherence, Hand overs and other related topics.
- A monthly IBI scorecard to be completed indicating the use of error prevention tools/ techniques; The assigned employee fulfilling the role of IBI representative has to attend the IBI representative's forum fortnightly, on Tuesdays, duration one hour.
- An IBI representative appointed by the *Contractor/Supplier/Consultant* to attend the IBI Representative Forum One (1) hour every Tuesday (forth nightly).
- IBI Awareness training will be provided by Lethabo Power Station personnel, free of charge, course bookings can be arranged by contacting Rabie Heymans on extension 5094".

#### 1.5 Transportation of passengers: open LDV's:

No *Eskom employee* or *Contractor* would be allowed to transport passengers on the back of open light delivery vehicles (LDV's).

It is a legal requirement to provide safe transportation of *Eskom* and *Contractor* employees – therefore the following will be enforced:

- All passengers must be transported in a closed vehicle with proper and adequate seating, fitted with safety belt for the number of passengers to be transported. NO passengers may be transported on the back of a light delivery vehicle (LDV) whether open or closed.
- Tools and equipment must be properly secured.
- Only authorised drivers may transport passengers.
- Proof must be submitted on request in terms of valid roadworthiness of the vehicle/s.
- The above must apply to on site and off-site transportation of passengers.

#### 1.6 Eskom Life Saving Rules:

Five Life-saving Rules have been developed that will apply to all Eskom employees, agents, consultants, and *Contractors*.

- **Rule 1:** Open, Isolate, Test, Earth, Bond, and/or Insulate before touch - that is any plant operating above 1 000 V.
  - **Rule 2:** Hook up at heights - no person may work at height where there is a risk of falling.
  - **Rule 3:** Buckle up – no person may drive any vehicle on Eskom business and/or on Eskom premises: unless the driver and all passengers are wearing seat belts.
  - **Rule 4:** Be sober (no person is allowed to work under the influence of drugs and alcohol).
  - **Rule 5:** Use a permit to work – where an authorization limitation exists, no person shall work without the required permit to work.
  - **Additional:** Texting and talking on the cell phone while driving or walking is prohibited.

#### 1.7 Local Safety Procedures

- The *Contractor* adheres to all local procedures. A list of local procedures is available on request from the *Employer*.

#### 1.8 Incidents / Accidents

- Incidents and accidents must be reported and investigated as detailed in LBA 00030. All incidents must also be reported to the *Employer* within 24 hours.

- First aid must be made available either by the *Contractor* or use can be made of the Lethabo medical centre at a fee. The availability of the *Contractor's* own first aid does not relieve the *Contractor* of his obligation to report and investigate the incident in accordance with Lethabo Procedure.

### 1.9 Fire Prevention

- Fire prevention and protection requirements to which *Contractors* must comply are detailed in LBA 00030.

### 1.10 Protective Equipment and Clothing

- The *Contractor* supplies his own personal protective equipment necessary to carry out the *works* and the *Contractor* shall ensure that all overalls for his staff have clearly identifying **company LOGO's**
- The *Contractor* is also responsible to inspect and maintain such equipment as required in terms of the OHS Act and local procedures.

### 1.11 Inspection of Equipment

- The *Contractor's* equipment is inspected by an authorised Eskom employee on arrival at the site.
- The following documentation is required to accompany the equipment where applicable: copies of all test certificates and maintenance records.
- Lifting equipment and electrical equipment must be marked with a unique number, code, or colour code for identification. If the equipment is found to be in an unsatisfactory condition or if insufficient maintenance has been carried out on the equipment, then it will not be approved for use on Site. A list of all lifting equipment and electrical equipment must be submitted to the *Employer* at least 2 days prior to the occupation date. This list must indicate the unique number and description of the equipment.

### 1.12 Documentation

The *Contractor* is responsible to have the following documentation available on site in accordance with LBA 00030:

- A copy of the OHS Act.
- Copies of all site accident report forms as required by the OHS Act.
- Copies of minutes of health and safety meetings held on site.
- Copies of inspection reports produced by the accident prevention officer

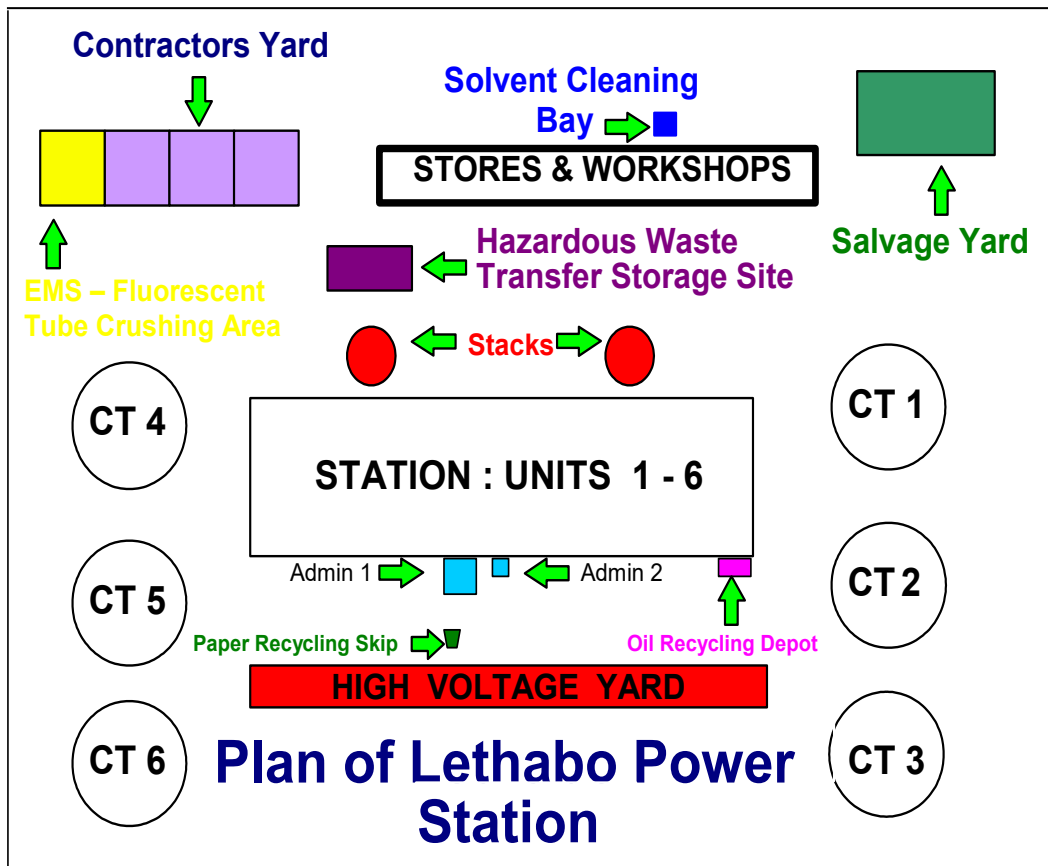
### 1.13 Environmental Policy and Waste Handling

Lethabo Environmental Statement of commitment must be adhered to.  
The contractor shall submit to Eskom an EMP to be reviewed and approved by Eskom environmental officer, one week before the commencement of *works*.

### 1.14 Disposal of Waste

Waste shall be removed promptly to the designated disposal area. No stockpiling will be permitted.

- Domestic waste to the white waste bins
- Production waste in the marked bins i.e., coal and ash only
- Paper and cans to their respective recycling bins
- Contact Civil Engineering for the disposal of building rubble
- Scrap metal, Wood & Rubber, Redundant Valves, Pipes, and Equipment etc. to be placed in the marked bins in the new Salvage Yard. Solvents and cloths used to the Cleaning Bay.



### 1.15 Hazardous Waste Disposal and Handling

- Hazardous / toxic waste includes all waste which contains elements or compounds listed as hazardous substances in terms of the Hazardous Substances Act No. 15 of 1973.
- Any *Contractor* who produces hazardous waste on site will be responsible for the safe removal of such waste to a registered Class I site by a waste removal and disposal body.
- The *Contractor* is required to produce a certificate of safe disposal in accordance with LBA 00054.
- The *Contractor* must ensure that persons handling hazardous waste have undergone suitable training and are acquainted with cleaning methods in case of a spillage.
- The *Contractor* is also responsible for the safe removal of their hazardous waste to Lethabo's Hazardous Waste Store. Other requirements for hazardous waste are detailed in LBA 00030.
- In order to ensure effective hazardous waste management, a copy of the *Contractors'* hazardous waste inventory must be supplied to the *Employer* at least 2 days prior to the occupation date.

### Abbreviated list of Hazardous Materials

Acids and alkalis	Hydrocarbons	Pesticides & insecticides
Antimony and its compounds	Inorganic cyanides	Pharmaceuticals
Arsenic compounds	Inorganic compounds containing halogens	Phosphorus and its compounds
Asbestos	Inorganic compounds containing sulphur	Selenium and its compounds
Barium compounds	Laboratory chemicals	Silver compounds
Beryllium compounds	Lead compounds	Tarry & petroleum products

Biocides & Phyto pharmaceuticals	Medical wastes	Tellurium and its compounds
Boron compounds	Mercury compounds	Thallium and its compounds
Cadmium and its compounds	Nickel and its compounds	Vanadium compounds
Chromium compounds	Organic halogen compounds	Zinc compounds
Copper compounds	Paints and paint sludges	Waste with flash point < 60°C
Heterocyclic organic compounds	Peroxides, chlorates	

#### 1.16 Plant & Materials

- The *Employer* may at his own discretion, supply any Plant and Materials as may be required by the *Contractor* to Provide the Works.
- The *Contractor* is to notify the *Employer* in writing, 48 hrs in advance, of such Plant and Materials required.

#### 1.17 Access to and Departure from the Site:

- The Site is at Lethabo Power Station situated ± 18 km South of Vereeniging on the Viljoensdrift - Deneysville Road, Free State. Access to the site will be via the main security gate only. The *Employer* informs the *Contractor* of the access procedures, and it should be expected that such procedures may change depending on the prevailing security situation.
- The *Contractor* allows in his price and program for delays at the security gate. The *Employer* reserves the right for its Security personnel to search persons or vehicles entering or leaving the premises. This includes but is not limited to briefcases and toolboxes.

#### 1.18 Temporary Gate Permits

- The *Contractor* provides the *Employer* with the personal details of their staff at least two days prior to the occupation date. All names and details to be submitted to the *Employer* who arranges for all gate permits.

#### 1.19 Equipment or Material Access and Removal

##### Access

- The *Contractor* ensures that all equipment and materials brought through the security gate is signed in at the main security gate on an OV18 form.

##### Removal

- The *Contractor* is not allowed to remove any equipment or materials from site without producing the relevant OV18 forms or the equipment lists.
- If the equipment or material is to be removed the same day, on which they were brought on to site, then the OV18 form will need to be produced at the gate when leaving the site.
- If the equipment or material is removed after this time then a Non-Returnable Gate Release will be provided by the *Project Manager*, on receipt of the original OV18, with which the *Contractor* brought the equipment on site.
- *Contractor* to provide his own scaffolding.

#### 1.20 Site or Area Establishment and Evacuation

##### Application for Site Establishment:

- Sites are allocated according to availability, the period for which the *Contractor* is going to be on site, or if special circumstances warrant the allocation of a site. Documentation to support this application can be submitted.
- The location of the site or area is indicated during the site or area take-over inspection.

**Site Establishment:**

- The *Contractor* does not occupy any site or area other than that allocated to him.
- The *Contractor* does not occupy the site or area prior to the take-over inspection.
- The *Contractor* maintains the site or area provided to him to the satisfaction of the *Employer*.
- The *Employer* subjects the *Contractor's* site or area to periodic inspection.

**Site Evacuation:**

- The *Contractor* advises the *Employer* in writing, five (5) days in advance of evacuation in accordance with LBA 00030. Immediately prior to evacuation the necessary take-over inspection must take place.

**1.21 Electrical Equipment / Appliances, Lighting and Power:**

- Any electrical equipment or appliances used by the *Contractor* must comply with all relevant safety regulations and requirements as detailed in LBA 00030 and be maintained in safe and proper working condition.
- The *Employer* has the right to stop the *Contractor's* use of any electrical equipment or appliance, which in the *Employer's* opinion does not conform to the foregoing.
- The *Contractor* provides at his own expense any temporary local lighting and ensures that it is in accordance with the requirements of the Factories Inspector.
- The *Contractor* provides at his own expense, all temporary wiring and cabling to route power from the point of supply to the various points where it is required, maintain same and remove on completion.

**1.22 Water**

- The *Contractor* provides at his own cost, all connection fittings, pipework, temporary plumbing, and pumps necessary to lead the water from the point of supply to the various points where it is required, maintain same and remove on completion.
- Such fittings must be compatible with the *Employer's* fittings so that galvanic corrosion of pipework is prevented
- Water wastage due to un-maintained pipe work or fittings provided by the *Contractor* will be calculated and will be for the cost of the *Contractor*.

**1.23 Compressed Air**

- The *Contractor* provides at his own cost, all connection fittings and pipe-work necessary to lead the compressed air from the point of supply to the various points where it is required, maintain same and remove on completion. Such fittings must be compatible with the *Employer's* fittings so that galvanic corrosion of pipework is prevented
- Compressed air wastage due to un-maintained pipe work or fittings provided by the *Contractor* will be calculated and will be for the cost of the *Contractor*.

**1.24 Ventilation**

- The *Contractor* is responsible for adequate ventilation of the *works*.

**1.25 Security**

- The *Contractor* is responsible for all security on *site*, fencing off, night watch and access control to secure all plant, materials, and the *works* itself. All these measures must be in accordance with any relevant regulations and standards and subject to the *Employer's* approval.
- It is also the *Contractors* responsibility to ensure the security of all completed portions of the *works* prior to Completion.

**1.26 Offices, Workshops and Stores**

- The *Contractor* shall provide, erect, and maintain for his own use, any additional office accommodation and stores he requires, together with drainage, lighting, heating, and hot and cold-water services as required.
- The *Contractor's* site establishment price includes all treatment of the site that he considers necessary for his entire operation throughout his period of occupation and under all weather conditions.
- The *Contractor* also includes for all security and access arrangements that he considers necessary.

**1.27 Sanitary Facilities**

- The *Contractor* shall provide service, maintain, and remove on completion any additional facilities required and allow for it in his *Price*.
- The *Contractor's* employees who work with asbestos are not allowed to use the *Employer's* ablution or messing facilities at the workplace during and after stripping of lagging materials, for fibres that may be attached to workers clothing, or to any other article.